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Revision 1

Ground-Water Screening Evaluation/Monitoring Plan -- 200 Area Effluent Treatment Facility (Project C-018H)

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Westinghouse
Hanford Company Richland, Washington

Management and Operations Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for public release

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U.S. Department of Energy Contract DE-AC06-87RL10930

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ABSTRACT

This report provides information that supports Washington State Waste Discharge Permit No. ST-4500 to dispose of treated effluent from the 200 Areas Effluent Treatment Facility on the Hanford Site. Permit ST-4500 was issued under the auspices of Washington Administrative Code 173-216. The report has two functions: (1) summarize the results of a multi-year characterization of the hydrogeology, sediment properties, and ground-water quality of the discharge site and (2) provide plans for evaluating the effects of the facility's operation on ground-water quality and document its compliance with applicable ground-water quality standards.

This report consists of the pre-operational ground-water screening evaluation and the ground-water monitoring plan. The ground-water monitoring plan includes a tritium tracking plan and a plan for updating and maintaining computer-encoded numerical models for predicting ground-water flow and tritium transport. A separate submittal will be prepared to comply with the effluent sampling requirements of Permit ST-4500, Sections S5 and S6 for the 200 Areas Effluent Treatment Facility and the Liquid Effluent Retention Facility.

Four deep and two shallow boreholes were drilled to define the stratigraphy, evaluate sediment characteristics, and establish a ground-water monitoring network for the discharge facility. Three of the deep boreholes were completed as ground-water monitoring wells and are being used to monitor ground-water quality in the uppermost aquifer upgradient and downgradient from the discharge facility. Tests were conducted in the two shallow boreholes to measure near-surface infiltration rates. This report contains plans for continuing the monitoring of ground-water quality and water levels after treated wastewater discharges to the facility begin.

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ACRONYMS

AFPM	Aquifer Porous Media
ASI	Advanced Sciences, Inc.
CRBG	Columbia River Basalt Group
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	Washington State Department of Ecology
EII	environmental investigations instructions
EPA	U.S. Environmental Protection Agency
ETF	Effluent Treatment Facility
GC	gas chromatography
HEIS	Hanford Environmental Information System
LERF	Liquid Effluent Retention Facility
LLWBG	Low-Level Waste Burial Ground
LLWMA	Low-Level Waste Management Area
NTU	nephelometric turbidity units
PCB	polychlorinated biphenyl
PNL	Pacific Northwest Laboratory
PQL	practical quantitation limit
PVC	polyvinyl chloride
QC	quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
RL	U.S. Department of Energy, Richland Operations Office
SC	specific conductance
SOLTR	Solute Transport
TC	total carbon
TDS	total dissolved solids
TIC	total inorganic carbon
TOC	total organic carbon
TOX	total organic halides
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WHC	Westinghouse Hanford Company

1.0 INTRODUCTION

This ground-water monitoring plan provides information supporting the U.S. Department of Energy's (DOE), Richland Operations Office (RL) State Waste Discharge Permit No. ST-4500 issued by the Washington State Department of Ecology (Ecology) in accordance with Revised Code of Washington (RCW) 90.48 and Washington Administrative Code (WAC) 173-216. RL will operate a facility designed to discharge wastewater from the 200 Areas Effluent Treatment Facility (ETF) to the soil column north of the 200 West Area (Figure 1-1). The site for disposal of this treated effluent was chosen based on a selection process described by Koegler (1990).

This report has two functions: (1) summarize results of a multi-year study to characterize the hydrogeology, sediment properties, and ground-water quality beneath the proposed site for disposal of the treated effluent and (2) provide plans to evaluate the effects of the disposal facility's operation on ground-water quality to confirm compliance with the ground-water quality standards of WAC 173-200-080(2) (Ecology 1994). The latter include a tritium tracking plan and a plan for updating and maintaining computer-encoded models for predicting ground-water flow and tritium transport. A separate submittal was prepared to comply with the effluent sampling requirements of Permit ST-4500, Sections S5 and S6 for the ETF and the Liquid Effluent Retention Facility (LERF) (WHC 1995).

Chapter 2.0 is the Pre-Operational Ground-Water Monitoring Report required by Permit ST-4500, Section S7.A. Chapter 2.0 summarizes all ground-water monitoring data from the three wells prior to startup of the facility. Chapter 3.0 is the Ground-Water Monitoring Plan required by Permit ST-4500, Section S7.B. Chapter 3.0 conveys the plans for evaluating the effects of the facility's operation on ground-water quality and documenting its compliance with applicable ground-water quality standards and the requirements of State Waste Discharge Permit ST-4500.

1.1 DESCRIPTION OF CONTENTS

Chapter 1.0 describes the purpose of the report. The information in Chapter 2.0 establishes a water-quality baseline for the facility. Chapter 2.0 includes summaries of predictive modeling of ground-water flow (Golder Associates 1990, 1991; Connelly et al. 1992; Lu et al. 1993), and summarizes information previously reported by Delaney and Harris (1991), Reidel (1993), and Reidel and Thornton (1993).

Chapter 3.0 defines, based on the information in Chapter 2.0, how environmental effects of disposal facility operation will be evaluated and how compliance with ground-water quality standards will be documented in accordance with the terms and conditions of Permit ST-4500. Chapter 3.0 provides information needed to demonstrate that the monitoring wells were properly located and constructed, and that representative ground water samples will be collected to document the status of facility compliance with ground-water quality laws and Permit ST-4500 operating conditions.

Chapter 4.0 provides information on how the monitoring results will be reported and the monitoring and reporting schedules. Chapter 5.0 lists all references cited in this plan. These references should be consulted for additional or more detailed information.

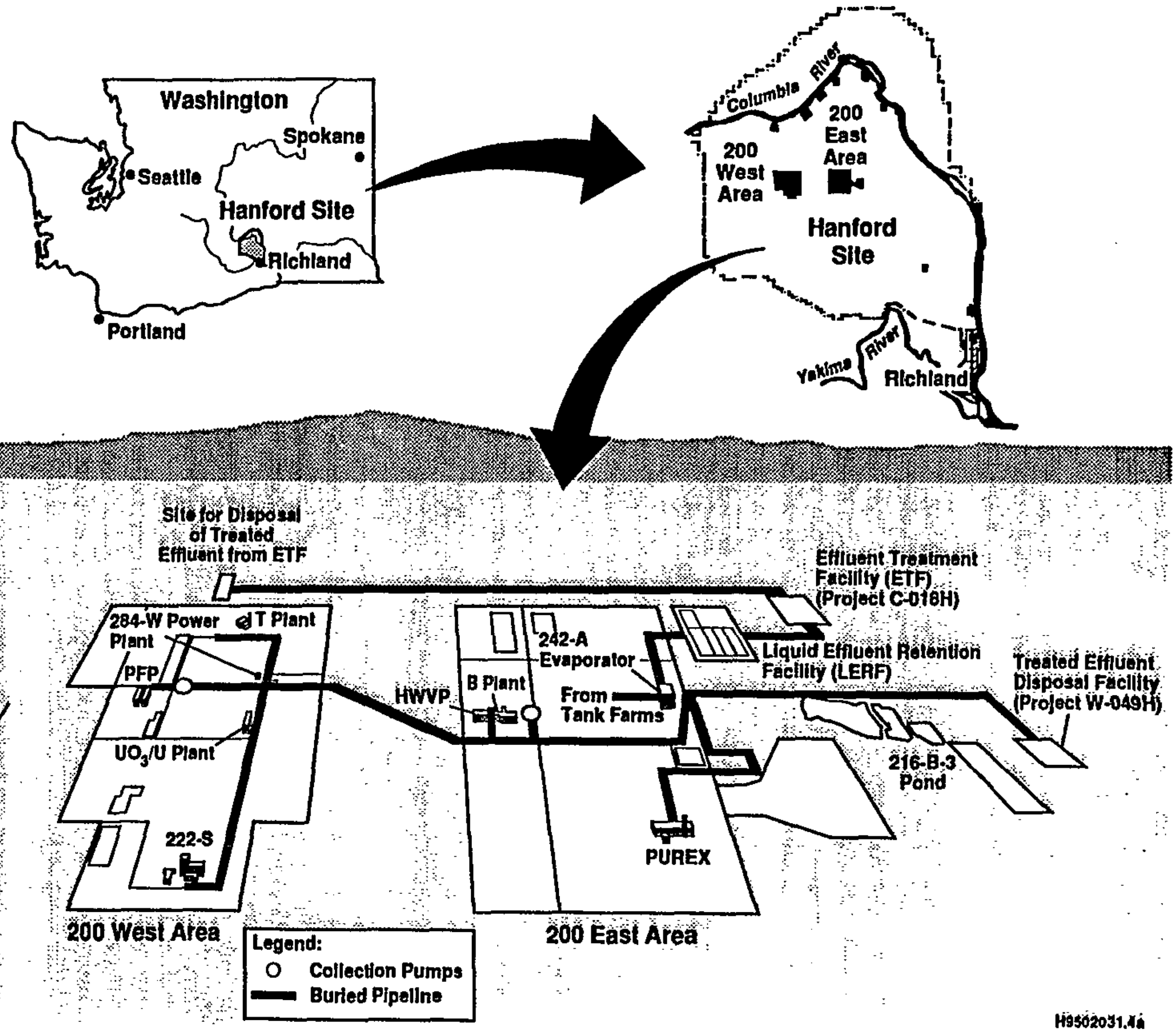

Figure 1-1. 200 Areas Effluent Treatment Facility and Related Infrastructure.

Appendices A through D consist of well logs, water-level measurements, ground water chemistry data, and background ground water chemistry data from the three site characterization/ monitoring wells drilled adjacent to the disposal facility. Appendix E provides well logs for the tritium-tracking network.

1.2 OBJECTIVES OF FACILITY

The disposal facility was located, designed, and constructed to provide a means to dispose of treated wastewater from the ETF, and water drawn from the ETF cooling tower (i.e., "blowdown" water). Because no viable means have yet been found to remove tritium from water, the discharge will contain tritium.

Tritium is projected to be present in treated effluent at an average annualized concentration of 5.6E+06 pCi/L (Crane 1993). Expected average concentration at a 90% confidence interval will be 6.3E+06 pCi/L; maximum concentration will be 2.4E+07 pCi/L (DOE-RL 1993). The maximum concentration would occur only if liquids from a relatively small number of double-shell tanks (DST) with high tritium concentrations were immediately processed through the 242-A Evaporator and the ETF without simultaneous throughput from other tanks.

Assuming an operating-efficiency of 72% at 150 gal/min (568 L/min), the maximum annual discharge of tritium from the ETF is projected to be ~1,200 Ci/yr. At the 90% confidence interval, maximum annual discharge of tritium would be ~1,350 Ci/yr. During the expected 30-yr operating life of the facility (Crane 1993), as much as 3,000 to 3,300 Ci of tritium may be discharged to the soil column.

The location and design of the disposal facility were based on a selection process and criteria originally described by Koegler (1990) and subsequently summarized by Brown (1993). The major factor in selecting the disposal site was to maximize the travel time of tritium (half-life 12.3 yr) to the Columbia River. A covered design was chosen to protect wildlife and minimize evaporation. Unlike past wastewater disposal facilities at the Hanford Site, this disposal facility will receive no untreated effluents or sanitary system water; all wastewater routed to the facility for disposal will have been processed by the ETF, as needed to comply with water-quality standards.

1.3 SCOPE OF FACILITY

The disposal facility consists of (1) a pipeline and transfer pumps that will transport treated wastewater from verification tanks at the ETF and (2) a "crib" that facilitates infiltration of the treated effluent into the soil (see Figure 1-1). (A crib is defined for purposes of this report as a covered drain field constructed below grade).

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2.0 PRE-OPERATIONAL GROUND-WATER MONITORING REPORT

This chapter outlines the relationship of the disposal site to related facilities, describes the disposal site, and summarizes hydrogeologic information from Reidel (1993), and Reidel and Thornton (1993). Chapter 2.0 also provides a brief synopsis of the predicted effects of the discharge on ground-water flow in the vadose zone and the uppermost aquifer (Golder Associates 1990, 1991; Lu et al. 1993), and water quality in the uppermost aquifer. The information in Chapter 2.0 corresponds to that required by Permit ST-4500, Section S7.A. This information is used to assess current ground-water quality and is the basis for the ground-water monitoring plan in Chapter 3.0.

2.1 RELATIONSHIP OF FACILITIES

All wastewater discharged to the disposal facility will be from the ETF. Effluent to be treated by the ETF will consist of vapor condensate from DST liquids piped to the 242-A Evaporator (see Figure 1-1) for volume reduction and other, yet to be determined, liquid effluents from 200 Area facilities and ground-water remediation projects. If other aqueous wastes from the 200 Areas require treatment by the ETF to comply with discharge limits assigned by Ecology, necessary permit modifications will be sought for discharge of those treated wastewaters.

As part of current 242-A Evaporator operations, the vapor condensate is filtered to remove particulates and is then passed through an ion-exchange column to remove radionuclides before being transferred to the LERF for temporary storage in covered impoundments (see Figure 1-1). The process concentrate from the 242-A Evaporator is in the form of a slurry. The slurry is designated an extremely hazardous mixed waste and is returned to the DSTs for storage pending further treatment.

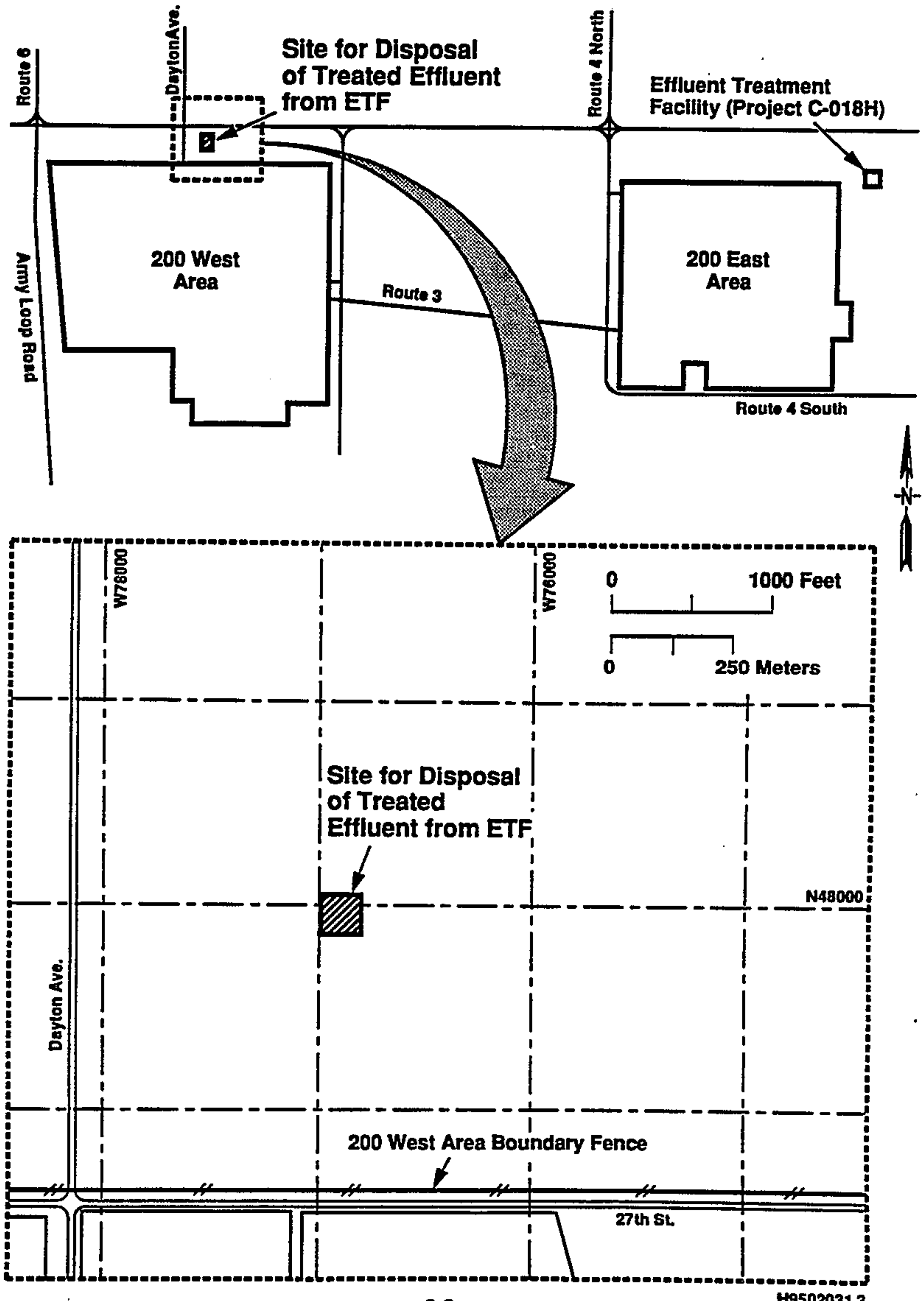
The ETF receives vapor condensates containing radionuclides and organic and inorganic constituents either directly from the 242-A Evaporator or from LERF storage. Because the ETF design incorporates a large ion-exchange unit, the ion-exchange column of the 242-A Evaporator is bypassed when the process condensates are being pumped directly to the ETF, to allow more rapid processing of the DST feed streams.

Wastewater discharged from the ETF to the disposal facility has been subjected to the best available treatment, considering all known, available, and reasonable methods of prevention, control, and treatment. ETF operations employ, as appropriate for the specific waste streams, coarse filtration, ultraviolet/hydrogen peroxide oxidation, pH adjustment, hydrogen peroxide decomposition, fine filtration, degasification, reverse osmosis, ion exchange, additional pH adjustment, analytical verification, and cooling of the treated wastewater (DOE-RL 1993).

2.2 FACILITY DESCRIPTION

The disposal facility is designed to infiltrate wastewater treated by the ETF into the soil column. The south edge of the disposal facility is located ~366 m (1,200 ft) north of the 200 West Area boundary, and is ~3.7 km (5.9 mi) west of the ETF (Figure 2-1). A 6-in. pipeline and transfer pumps transport the treated effluent and cooling tower blowdown from the ETF to the disposal facility.

Figure 2-1. Location of Disposal Facility.



At the design capacity of the ETF (Crane 1993), 568 L/min (150 gal/min) of treated water and 83 L/min (22 gal/min) of cooling tower blowdown may be discharged to the soil column. The design capacity of the disposal facility was based on these projected discharge rates and an estimated infiltration capacity of 400 L/d/m^2 (10 gal/d/ft^2) (Westinghouse Hanford Company [WHC]) (WHC 1990). Based on these design parameters, 2,000 m^2 (22,000 ft^2) of infiltration surface was deemed to be needed.

As shown in Figure 2-2, the disposal facility is ~35 m (~116 ft) wide by 61 m (200 ft) long. Treated effluent is delivered to the crib via a 20-cm (8-in.) diameter distribution header. The treated effluent is evenly spread over the surface of the crib via 66 perforated distribution laterals made of 10-cm (4-in.) diameter pipes buried 15 cm (6 in.) below grade and spaced 1.8 m (6 ft) apart.

The distribution laterals drain into a 1.8-m (6-ft) deep bed of washed cobbles that, in turn, facilitate drainage into the soil column. The distribution header, laterals, and washed cobbles are covered by an impermeable membrane protected on its top and bottom sides by geotextile fabric (Figure 2-3). The rock-filled drainage basin was constructed entirely below grade. The ground surface was mounded slightly to promote surface runoff.

2.3 RESULTS FROM SUBSURFACE BASELINE CHARACTERIZATION

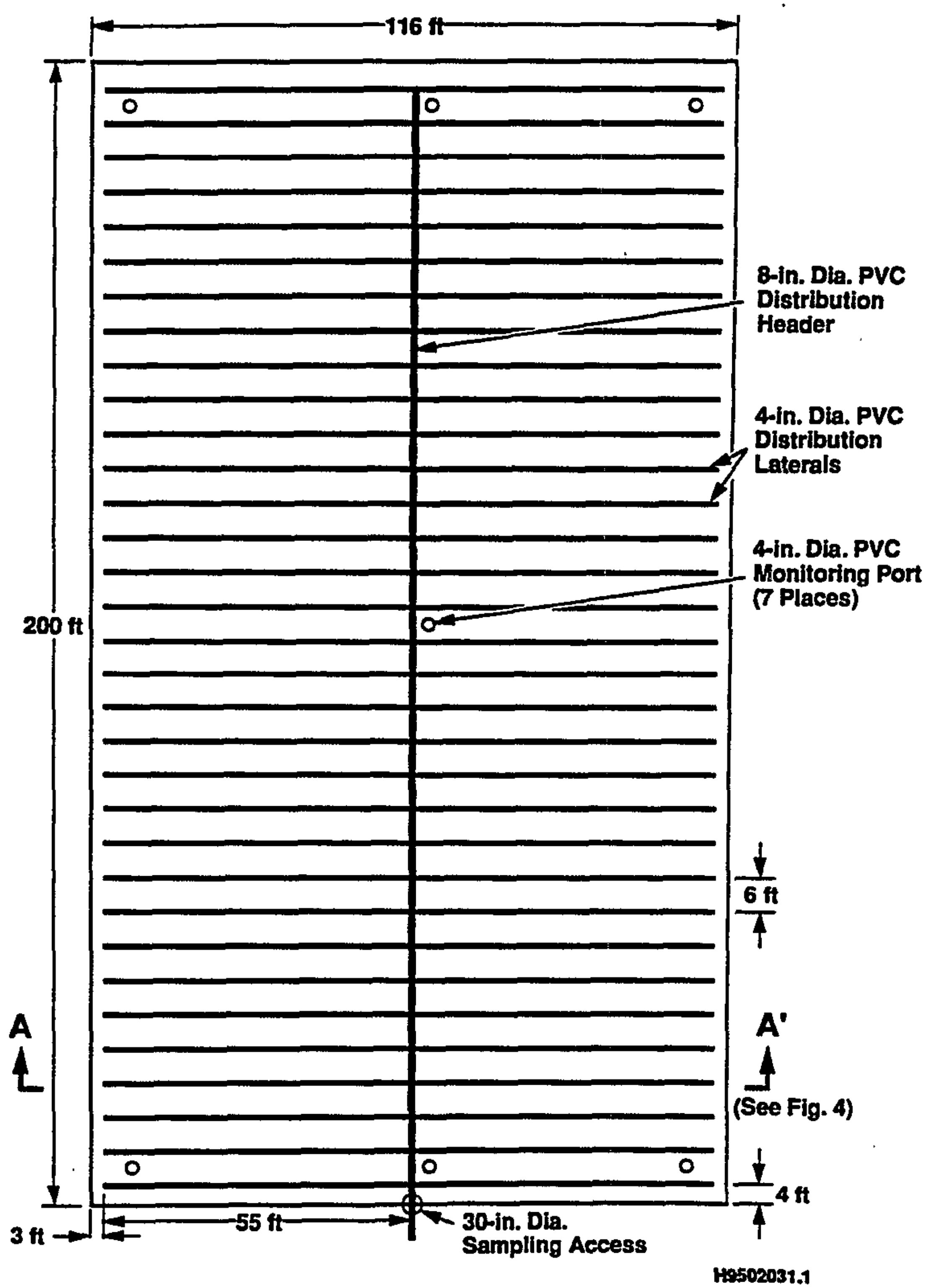
This section summarizes current knowledge of the geology, soil chemistry, hydrology, and current ground-water quality at the disposal site (Reidel 1993; Reidel and Thornton 1993). This section also summarizes hydrogeologic modeling of the 200 West Area and vicinity (Connelly et al. 1992), an analysis of treated effluent movement through the vadose zone beneath the disposal site (Lu et al. 1993), and prediction of tritium migration in the uppermost aquifer that will result from discharges to the facility (Golder Associates 1991).

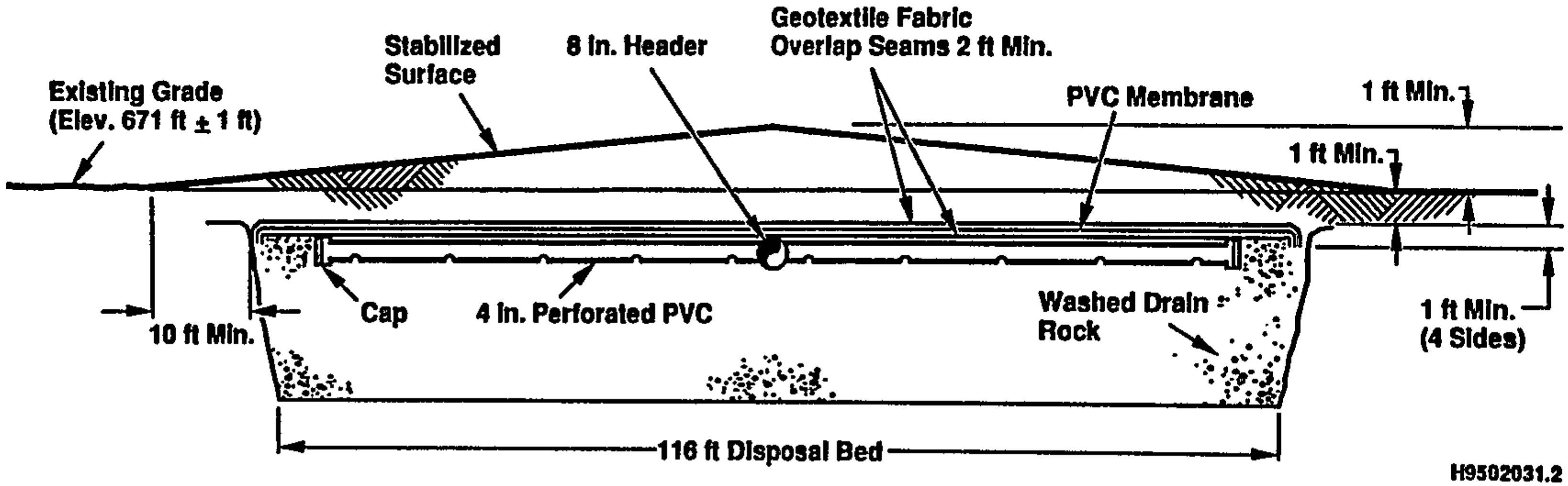
Information is provided on the location, use, and construction of all known wells within 1.6 km (1 mi) of the disposal site. Details of the drilling, construction, development, and well testing are provided by Advanced Sciences, Inc. (ASI) (ASI 1995) for the three wells adjacent to the facility that will be used for permit-compliance monitoring. Finally, this section summarizes results of chemical analyses of sediments from the three wells. These analyses were previously reported in detail (WHC 1993).

2.3.1 Ground-Water Monitoring/Site Characterization Wells

To determine the stratigraphy of the disposal site, evaluate sediment characteristics, and establish a ground-water monitoring network, four new boreholes were drilled (Figure 2-4). Borehole 699-48-77B was drilled to a depth of 18 m (~60 ft) and decommissioned because of its substantial deviation from plumb. The three remaining boreholes are being used as ground-water monitoring wells for the disposal facility. Information on the locations of the three wells are provided in Table 2-1. Details of well construction and development are provided by ASI (1995). Wells 699-48-77A, 699-48-77C, and 699-48-77D were constructed and completed in compliance with requirements of the *Resource Conservation and Recovery Act of 1976* (RCRA) to monitor the upper part of the uppermost aquifer. The basis for the well locations and construction specifications is discussed in Chapter 3.0.

Figure 2-2. Plan View of Disposal Facility Design.
(simplified from as-built ICF Kaiser engineering drawing No. H-2088755)





Section A-A'

Figure 2-3. Elevation View of Disposal Facility Design.
(simplified from as-built ICF Kaiser engineering drawing No. H-2-88755.)

Figure 2-4. Site Characterization/Monitoring Wells for the Disposal Facility.

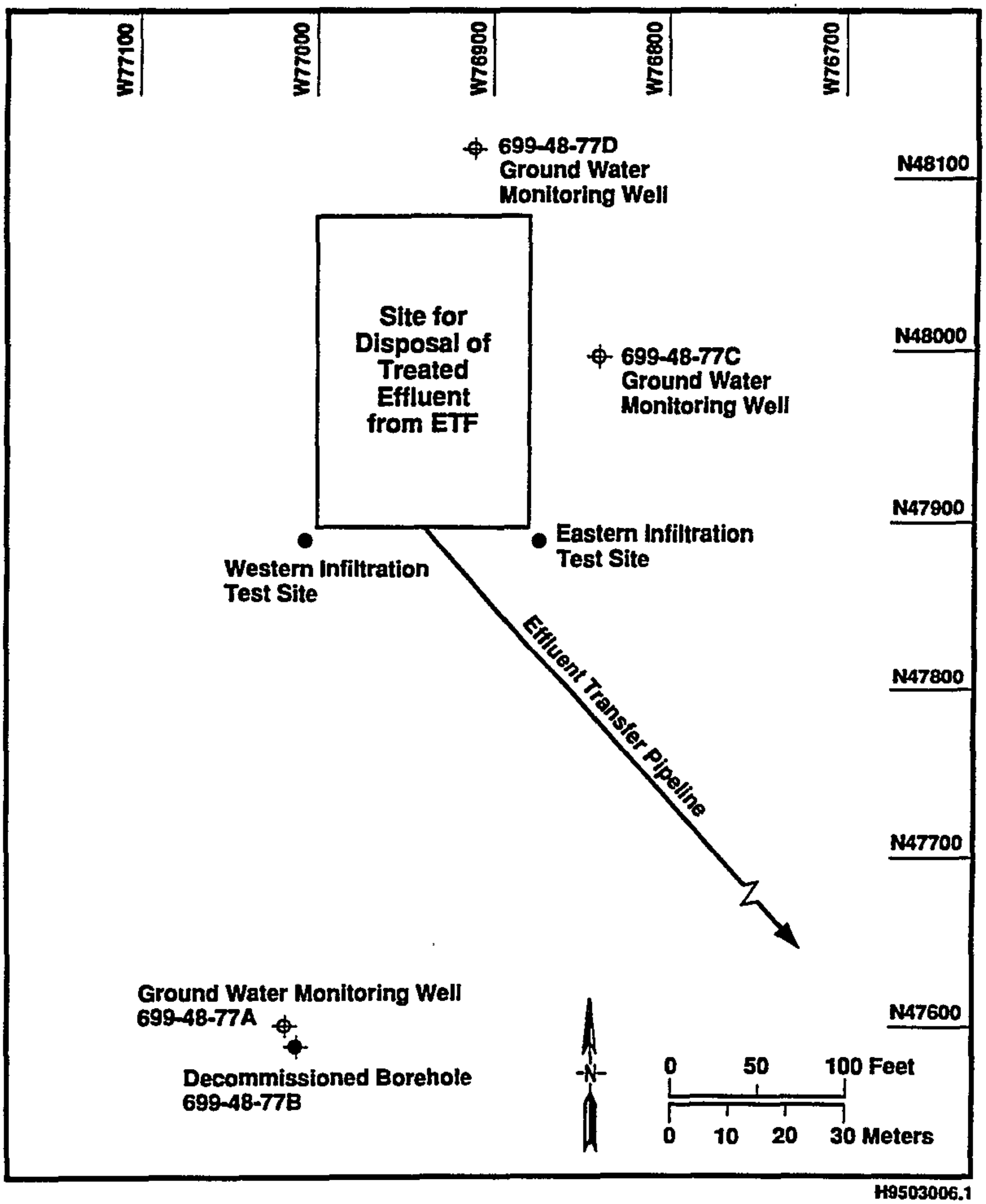


Table 2-1. Location Data for Site Characterization/Ground-Water Monitoring Wells.

Borehole	Coordinates		Elevations		
	200 W (ft)	Lambert NAD '83(m)	Top of brass cap	Hydrostar[a] plate	Top of outer casing[b]
699-48-77A	N:47602.7 W:77020.0	N:137969.02 E:566413.57	672.25	674.74	674.72
699-48-77B	N:47590.0 W:77013.3	N:137965.15 E:566415.60	671.73	N/A	N/A
699-48-77C	N:47989.32 W:76836.16	N:138086.801 E:566468.954	671.91	N/A	674.28
699-48-77D	N:48096.14 W:76952.88	N:138119.268 E:566433.302	671.37	N/A	673.87

[a]Trademark of Instrumentation Northwest, Inc., Redmond, Washington.
[b]Measured on north side.
NAD = North American Datum.

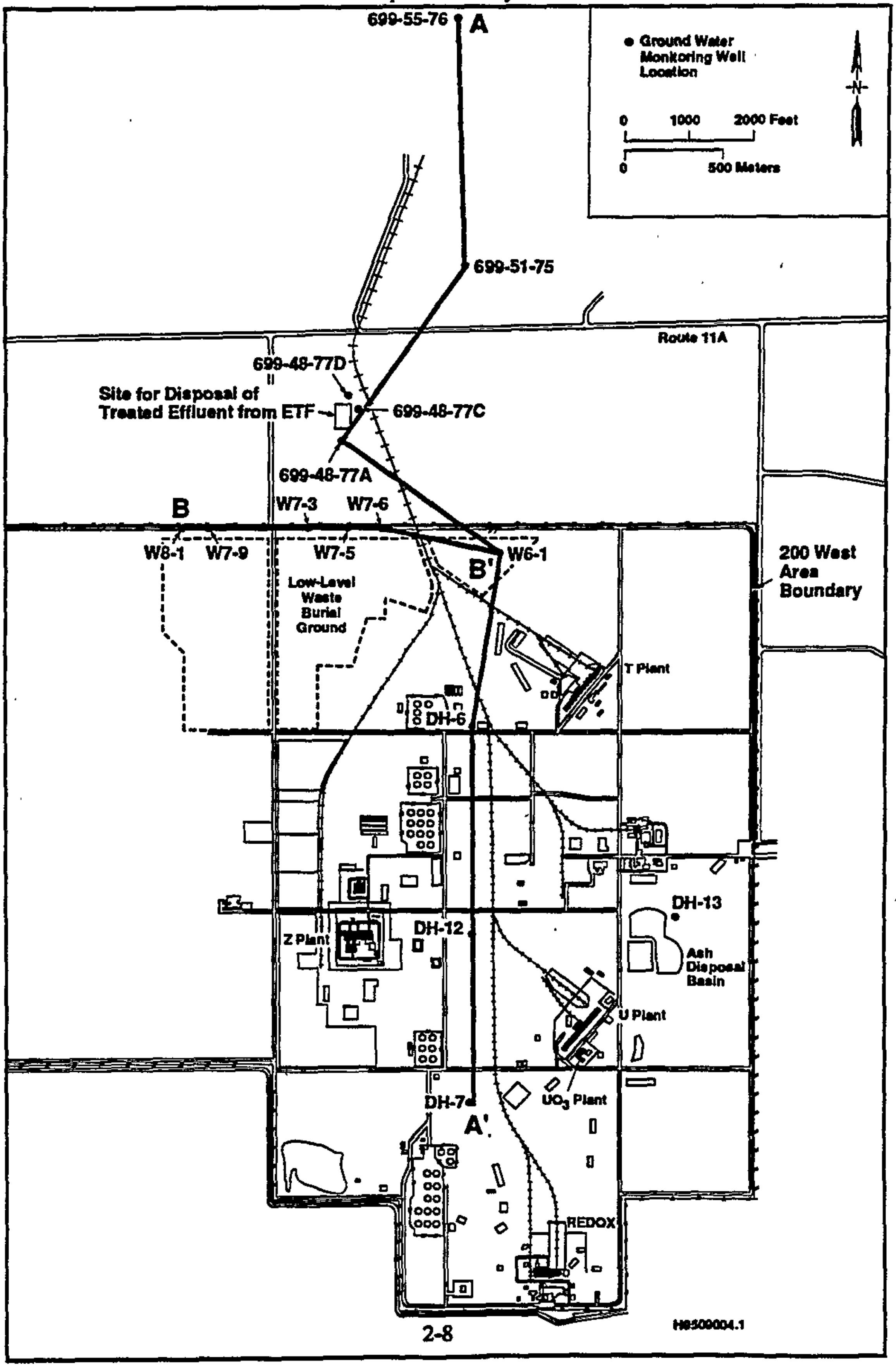
Lithologic and hydrologic data from other nearby wells were used to complement the information acquired from the three new ground-water monitoring wells at the disposal site. These wells include 20 wells upgradient from the disposal site at the Low-Level Waste Burial Grounds (LLWBG) in the 200 West Area (Figure 2-5). Wells south of the disposal facility are sampled quarterly as part of the RCRA ground-water monitoring program for the Hanford Site and are <600 m (<2,000 ft) south of the facility. Wells north, east, and west of the facility are sampled by the Pacific Northwest Laboratory (PNL) Ground-Water Surveillance Project and the RCRA Ground-Water Monitoring Program at a quarterly-to-annual frequency (also see Section 3.7.3). Information from these wells was used to help interpret the stratigraphy, geologic structure, and ground water hydrology in the vicinity of the disposal site.

2.3.2 Geology

This section describes the geologic and stratigraphic setting of the Hanford Site and the disposal facility, with emphasis on the sediments overlying basalt.

The geology of the Hanford Site and the Pasco Basin has been characterized by Myers et al. (1979), DOE (1988), Delaney et al. (1991), and Reidel et al. (1992). Lindsey et al. (1992) discussed the origin of the sediments overlying basalt bedrock and provided a detailed description of their stratigraphic relationships. More recently, Lindsey's stratigraphic nomenclature was modified by Thorne et al. (1994), based on the hydraulic characteristics of the sediments. The geology of the disposal facility and vicinity was originally described by Lindsey and Reidel (1992), Reidel and Thornton (1993), and Reidel (1993) based on data from two boreholes. Subsequent drilling of two additional characterization/ground-water monitoring wells at the facility allowed refinement of earlier hydrogeologic interpretations. The following sections summarize pertinent information from these reports.

Figure 2-5. Locations of Geologic Cross Sections, Boreholes, and Monitoring Wells Near the Disposal Facility.



2.3.2.1 Hanford Site Geology. The Hanford Site lies within the Columbia Plateau. The Columbia Plateau consists of a thick sequence of Miocene-age tholeiitic basalt flows called the Columbia River Basalt Group (CRBG). These flows have been folded and faulted during the past 17 million years, creating broad structural and topographic basins separated by asymmetric anticlinal ridges. Sediments up to 518 m (1,700 ft) thick have accumulated over the CRBG in some of these basins. These sediments are of late Miocene, Pliocene, and Pleistocene age. The Hanford Site is located within one of the larger basins, the Pasco Basin. The Pasco Basin is bounded on the north by the Saddle Mountains and on the south by Rattlesnake Mountain and the Rattlesnake Hills.

Principal stratigraphic units underlying the Hanford Site include, in ascending order, the CRBG (Miocene), Ringold Formation (Miocene-Pliocene), Plio-Pleistocene unit and early "Palouse" soil, and the Hanford formation (Pleistocene). A regionally-discontinuous veneer of recent alluvium, colluvium, and/or eolian sediments overlies the principal geologic units. Figure 2-6 shows the general stratigraphy of the Hanford Site. Figure 2-7 depicts stratigraphic relationships and provides the nomenclature for sediments overlying basalt.

Sediments overlying the basalt at the disposal facility are the late Miocene-to-Pliocene Ringold Formation, relatively thin and discontinuous sediments of Pliocene-Pleistocene age (which occur in the western part of the Hanford Site), the Pleistocene-age Hanford formation, and surficial alluvium and dune sand of Holocene age.

Sediments of the Ringold Formation are fluvio-lacustrine in origin and have been grouped into units based on facies (Figure 2-7). The Ringold Formation is absent from portions of the northeastern part of the Hanford Site, but is up to 185 m (~600 ft) thick in the west-central part (Reidel et al. 1992). The dominant facies of the Ringold Formation are fluvial sand and gravel, fine-grained sand, and silt and clay of stream overbank and lacustrine origin. Variable amounts of $CaCO_3$ cementation occur in the Ringold Formation.

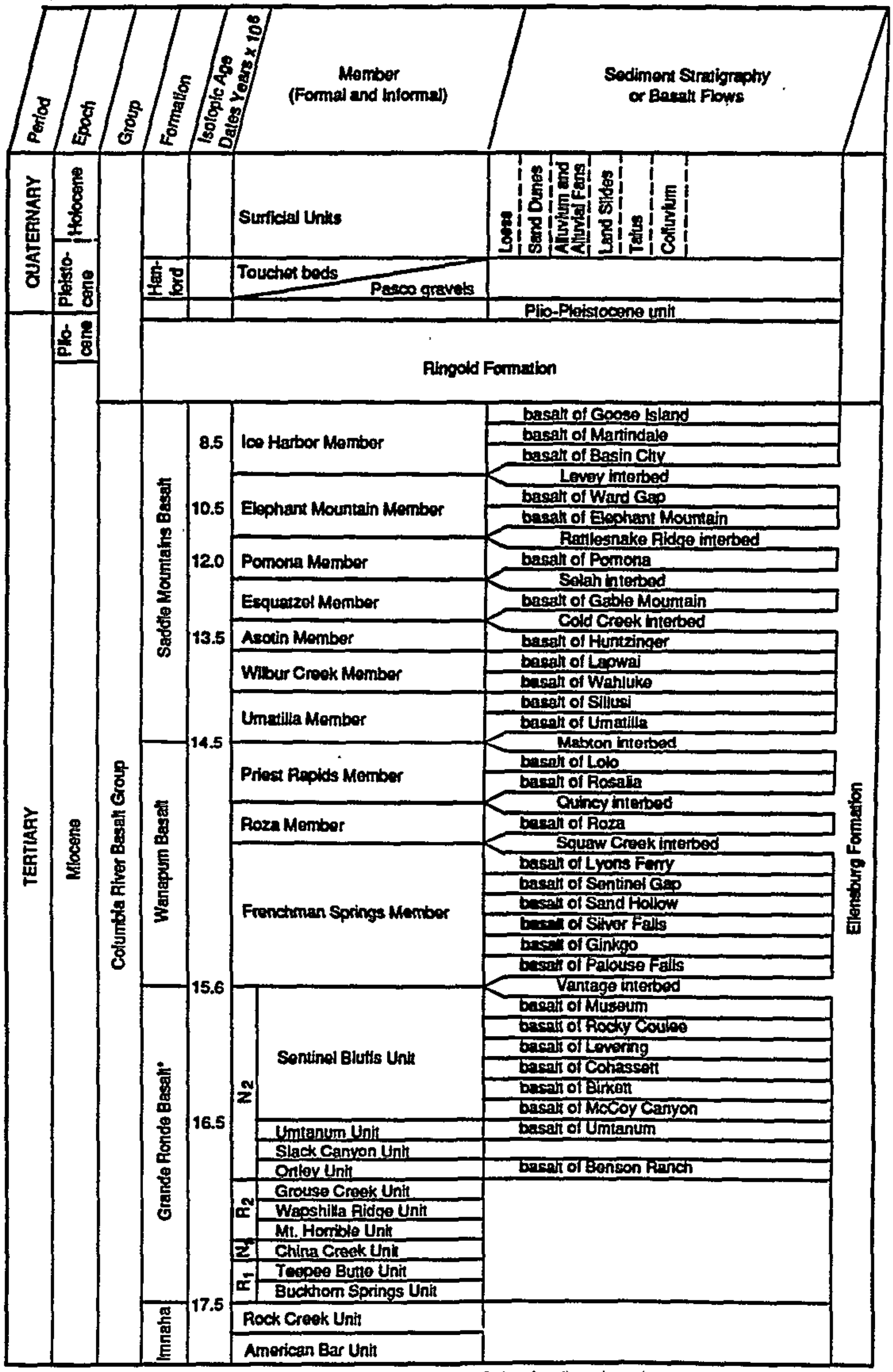
The Hanford formation consists of cataclysmic flood deposits of sand, gravel, and interbedded silt which, in aggregate, are up to 110 m (~350 ft) thick. Hanford formation sediments typically are less consolidated than Ringold Formation sediments and open-framework gravels are common (Reidel et al. 1992). The Hanford formation is informally subdivided into three principal facies: gravel-dominated (pebble to boulder clast sizes), sand-dominated, and silty.

2.3.2.2 Geology of the Disposal Facility Site. Interpretation of the geology of the disposal site is based on data gathered from the four site characterization/monitoring boreholes, nearby wells drilled for the RCRA and Operations ground-water monitoring networks, and older wells used for sitewide monitoring. These data were evaluated in conjunction with published stratigraphic correlations (e.g., Lindsey and Reidel 1992) to refine the hydrogeology of the disposal facility site.

Cross sections A-A' and B-B' (Figures 2-8 and 2-9) show stratigraphic relationships across the 200 West Area and vicinity in north-south and east-west directions, respectively. The locations of these cross sections are shown in Figure 2-5.

The stratigraphy in the immediate vicinity of the facility is illustrated by the lithologic log from well 699-48-77A (Appendix A) and the cross section C-C' of Figure 2-10. The locations of wells used to construct the cross sections of Figure 2-10 are shown in Figure 2-4.

Figure 2-6. Generalized Stratigraphy of the Hanford Site.



*The Grande Ronde Basalt consists of at least 120 major basalt flows. Only a few flows have been named. N_2, R_2, N_1 and R_1 are magnetostratigraphic units.

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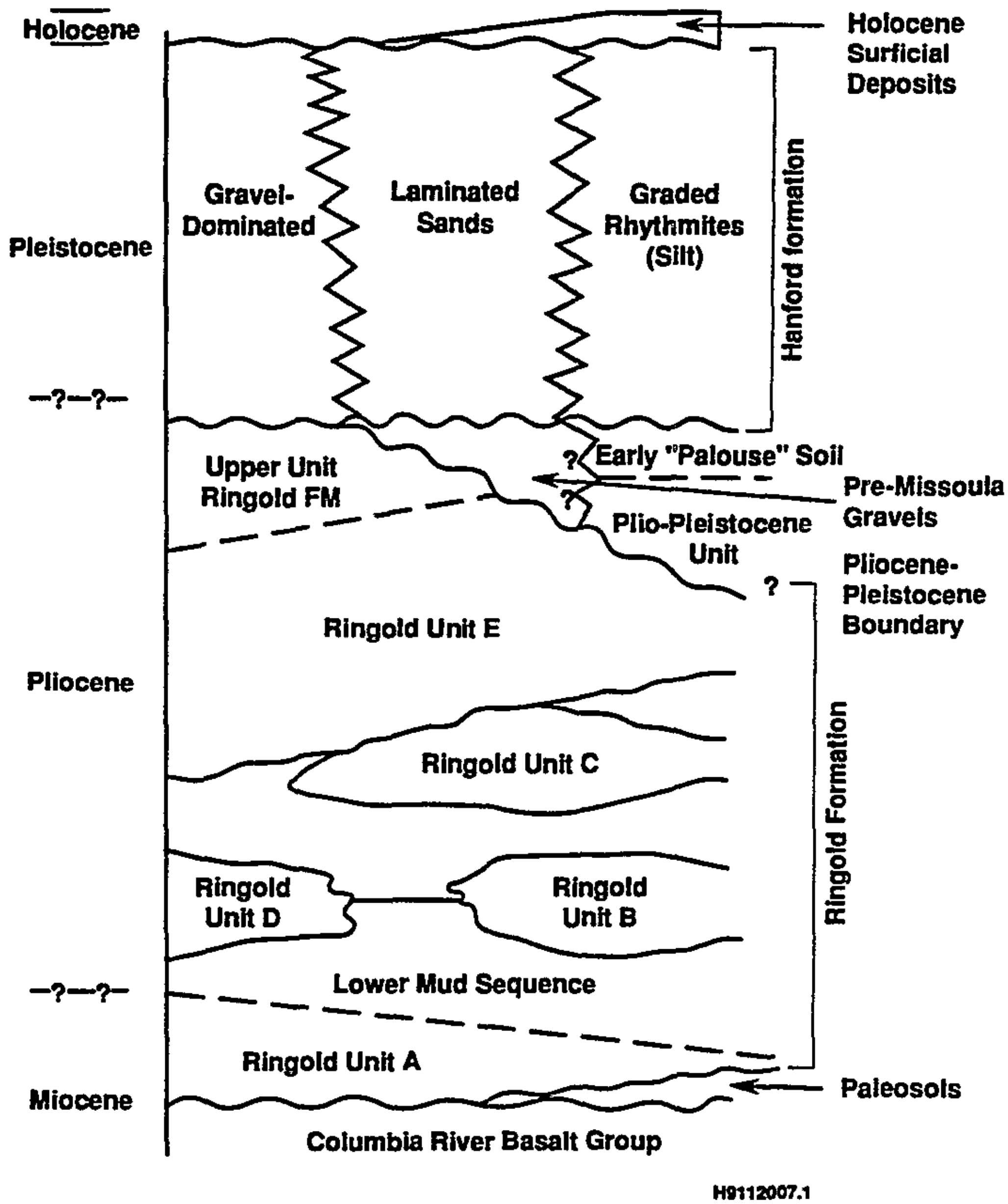
Figure 2-7. Stratigraphic Relationships of Sediments Above Basalt at the Hanford Site. (after Lindsey et al. 1992)



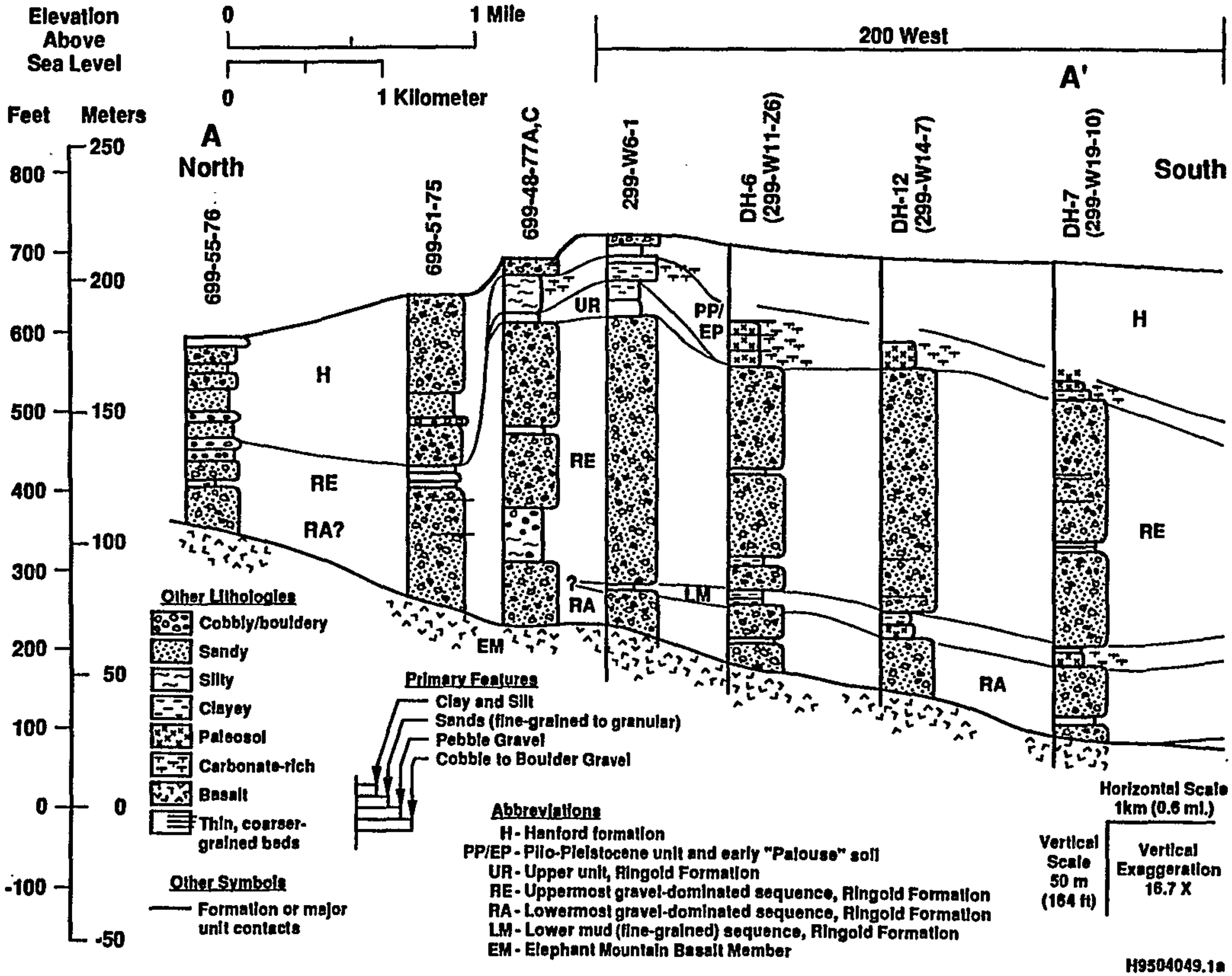


Figure 2-8. Cross Section A-A'.
(modified from Lindsey and Reidel 1992)

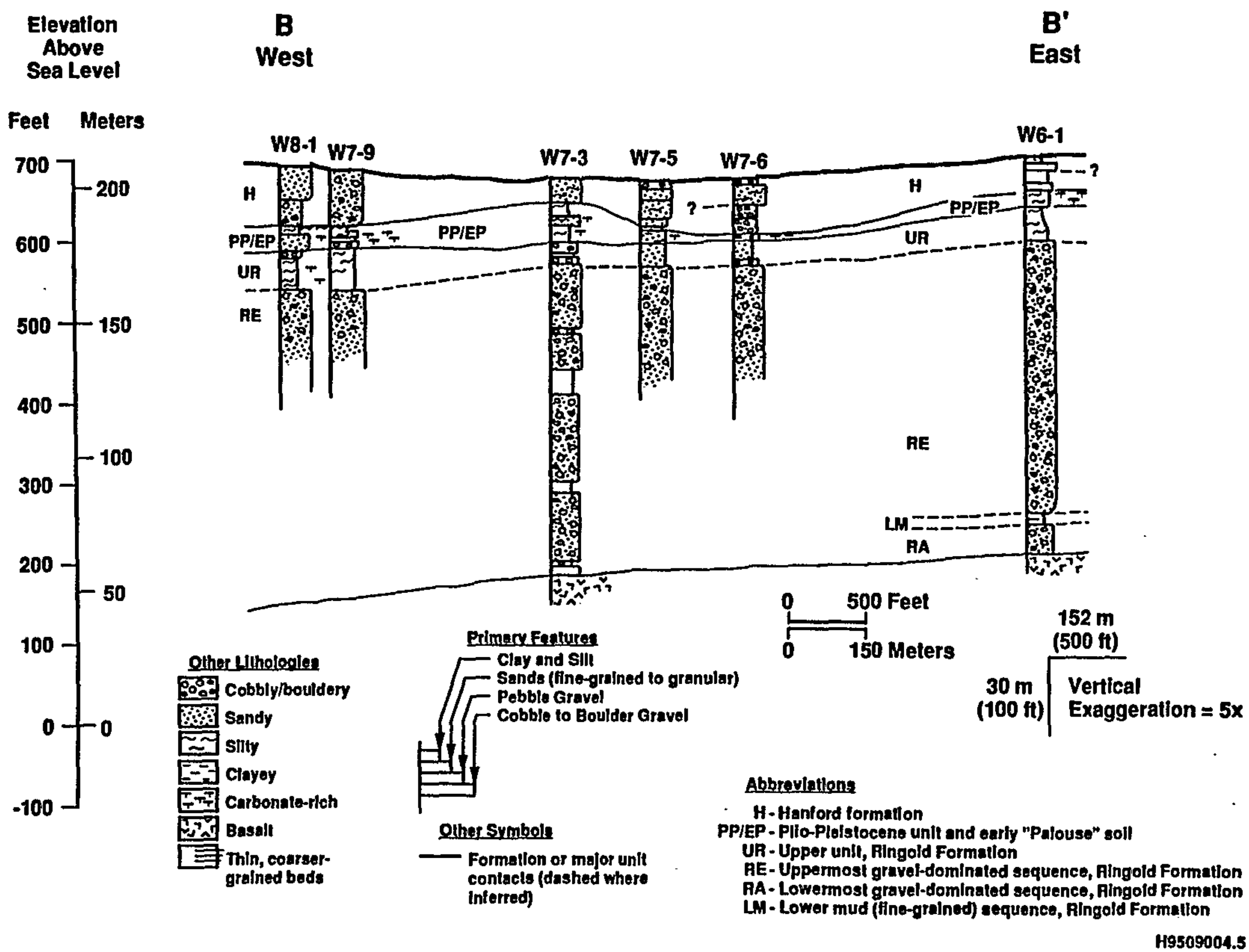


Figure 2-9. Cross Section B-B'.
(modified from Lindsey and Reidel 1992)

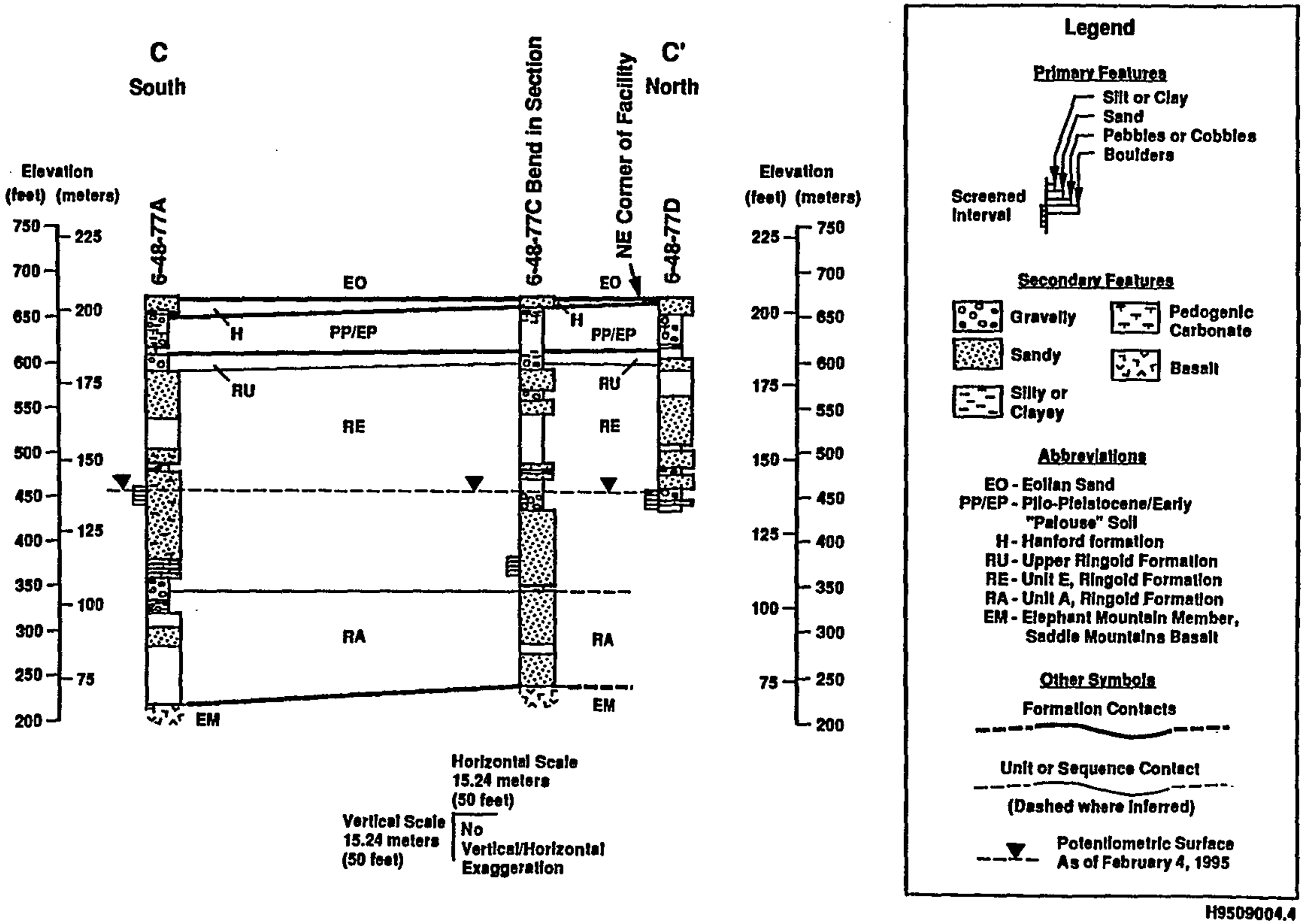


Figure 2-10. Cross Section C-C'.

The surface of the uppermost flow of the CRBG beneath the facility, the Elephant Mountain Member of the Saddle Mountains Formation, is present at an average depth of 132 m (433 ft) below ground surface, and is at a depth of ~139 m (455 ft) in well 699-48-77A. The surface of the basalt beneath the facility slopes to the south at ~3°.

The Ringold Formation sediments beneath the facility are those of unit A and unit E gravels, and the sands/gravelly sands of the "upper" Ringold unit. The overall thickness of the Ringold Formation at the facility is ~119 m (~390 ft). Of this thickness, unit A comprises ~40 m (~130 ft); unit E ~74 m (~242 ft); and the "upper" Ringold ~5 m (~17 ft). The location of the contact between units A and E is inferred by projection from a well (299-W6-1) south of the facility (see Figure 2-5). The Ringold lower mud sequence usually provides a reference horizon for separating units A and E, but is absent in the vicinity of the disposal facility. Moreover, Ringold sediments identified as unit E may include sediments designated elsewhere as unit C. Because of the similarities between units E and C and the type of drilling employed, the two units were not differentiated at the facility site. Well logs suggest that local horizons of $CaCO_3$ cementation occur within Ringold units A and E (see Section 2.3.6.1).

The Plio-Pleistocene and early "Palouse" soil combined are ~16 m (~51 ft) thick beneath the facility, and are encountered 2 m (6 ft) below the surface in well 699-48-77D and 7 m (22.5 ft) below the surface immediately south of the disposal facility in well 699-48-77A. The Plio-Pleistocene unit is noteworthy for its thin horizons of pedogenic and cementitious carbonate separated by carbonate-poor silt and sand. Lindsey and Reidel (1992) describe the Plio-Pleistocene and early "Palouse" soil as occurring discontinuously throughout much of the 200 West Area, but the degree of lateral continuity of carbonate-cemented horizons in the immediate vicinity of the facility is problematic. All three site characterization/monitoring wells intercepted carbonate-cemented horizons in the Plio-Pleistocene/early "Palouse" soil, but significant differences in the amount of cementation were noted in two shallow boreholes used for infiltration tests (see Figure 2-4 and discussion in Section 2.3.6.2).

The Hanford formation is from 1.4 m (4.5 ft) to 6.4 m (21 ft) thick in the vicinity of the disposal facility, but was largely removed from beneath the facility during drain field construction. This thin occurrence of Hanford formation is dominated by sandy, silty gravel. Minor amounts of cementation by unidentified minerals occur near the bottom of the unit. The Hanford formation is overlain by 0.5 m (1.5 ft) of eolian sand at the disposal site.

Most relatively small-scale structures in the basalt bedrock and Ringold Formation trend roughly east-west, in accordance with the major structural features, such as the Gable Butte/Gable Mountain anticline, the Cold Creek syncline, and the Yakima Ridge anticline. In the vicinity of the facility, both the basalt and overlying Ringold sediments dip gently to the south.

2.3.3 Ground Water Hydrology

This section summarizes current knowledge of the factors controlling ground water occurrence and movement within the uppermost aquifer beneath the disposal facility. The summary includes information from earlier hydrologic investigations at the facility (Ballantyne 1993; Reidel 1993; Swanson 1994a). The hydrogeologic setting of the 200 West Area (immediately south of the facility) was described by Connelly et al. (1992) and Ford and Trent (1994).

Ground water levels are currently measured quarterly in all three wells at the facility. Quarterly measurements have been made since May 1994 in wells 699-48-77C and 699-48-77D, and since June 1992 in well 699-48-77A. Water levels are measured annually in wells north, northwest, and northeast of the facility as part of the sitewide ground-water surveillance program. Water levels in wells monitored for RCRA/Operational programs in the 200 West Area (immediately south of the facility) are measured at monthly to annual frequencies. Figures 2-5 and 3-4 show wells in the vicinity of the facility that currently monitor ground water for these programs or that are available for use in monitoring.

2.3.3.1 Precipitation and Ground-Water Recharge. Average annual precipitation at the Hanford Site from 1961 to 1990 was 159 mm (6.26 in.) (Hoitink and Burk 1995). Of this total, only 5 to 10 mm (0.2 to 0.4 in.) are estimated to contribute to ground-water recharge in the vicinity of the disposal facility (Fayer and Walters 1995).

2.3.3.2 Uppermost Aquifer. Data gathered from drilling and testing of the three site characterization and monitoring wells show that ground water moves primarily within Ringold units A and E. The water table currently is at a depth of ~66 m (~217 ft) below ground surface at the disposal facility. This depth coincides with a level approximately halfway through the Ringold unit E. No specific confining layers have been identified at this location. Hydraulic head decreases to the northeast. Although contacts between lithologic units are interpreted to dip very gently southward, the northeastward movement of ground water is not prevented by the geologic structure of the aquifer.

Hydrographs of the three wells (Figure 2-11) indicate that ground water levels beneath the facility have fallen gradually since water-level measurements began in early 1993. Between January 1993 and April 1995 the water level in well 699-48-77A fell 0.54 m (1.80 ft). A general decline in water levels over the last 2 yr is evident from the hydrograph. This decline is a result of the cessation of operations of the 216-U-10 Pond. This facility ceased operating in 1984, but the remnant of a ground water mound generated by the pond still dominates the subsurface hydrology of the 200 West Area. The potentiometric surface in the vicinity of the 200 West Area and the disposal facility, for December 1994, is shown in Figure 2-12. Appendix B lists results of water-level measurements in the three wells since monitoring began.

2.3.3.3 Results of Aquifer Testing. Results of aquifer testing in the three site characterization/ monitoring wells are described in detail by Swanson (1994a). A summary of that work is presented here.

Well 699-48-77C was used as the pumping well in all tests. Three constant-rate pumping tests (with recovery phases) and three slug tests were conducted at three depth intervals in the well. These intervals were; 74.53 to 78.81 m (244.37 to 258.40 ft), 91.41 to 96.18 m (299.70 to 315.36 ft), and 117.24 to 122.01 m (384.40 to 400.02 ft). Wells 699-48-77A, 699-48-77D, and two wells in the 200 West Area were used as observation wells, but only well 699-48-77D and the stressed well, 699-48-77C, measurably responded to the tests. The tests were conducted during the period from March 4 to March 31, 1994. Baseline conditions and barometric efficiencies were determined in all three wells prior to testing. Barometric efficiencies are: well 699-48-77A - 60%; well 699-48-77C - 59%; and well 699-48-77D - 55%. Barometric efficiency is a measure of a well's water-level response to change in barometric pressure. The above barometric efficiencies of the three facility wells indicate confined-aquifer conditions. Table 2-2 lists significant results of the aquifer tests for each tested interval.

Figure 2-11. Hydrographs of the Three Site Characterization/Ground-Water Monitoring Wells.

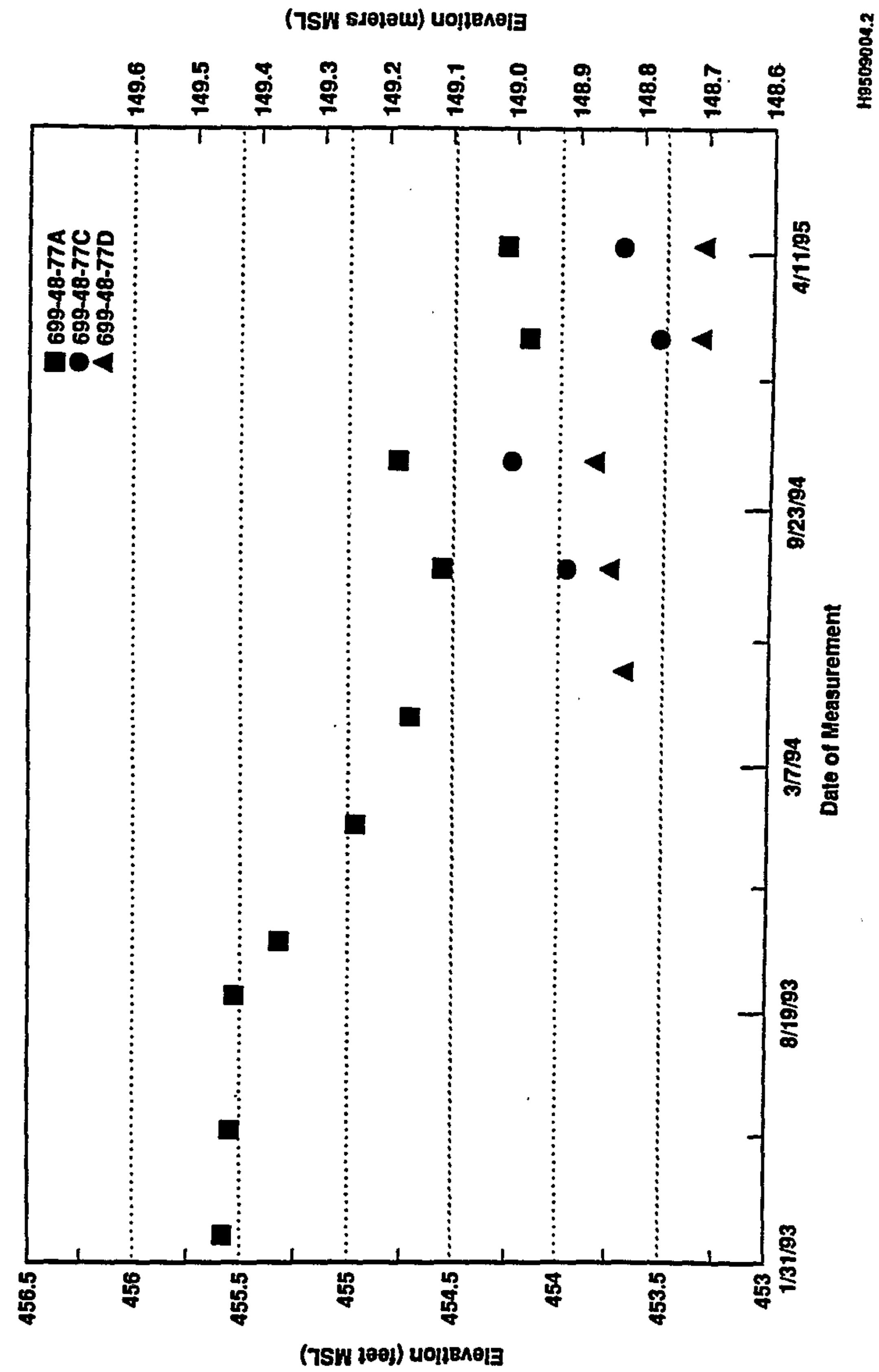


Figure 2-12. Potentiometric Surface, December 1994.
(after Serkowski et al. 1995)

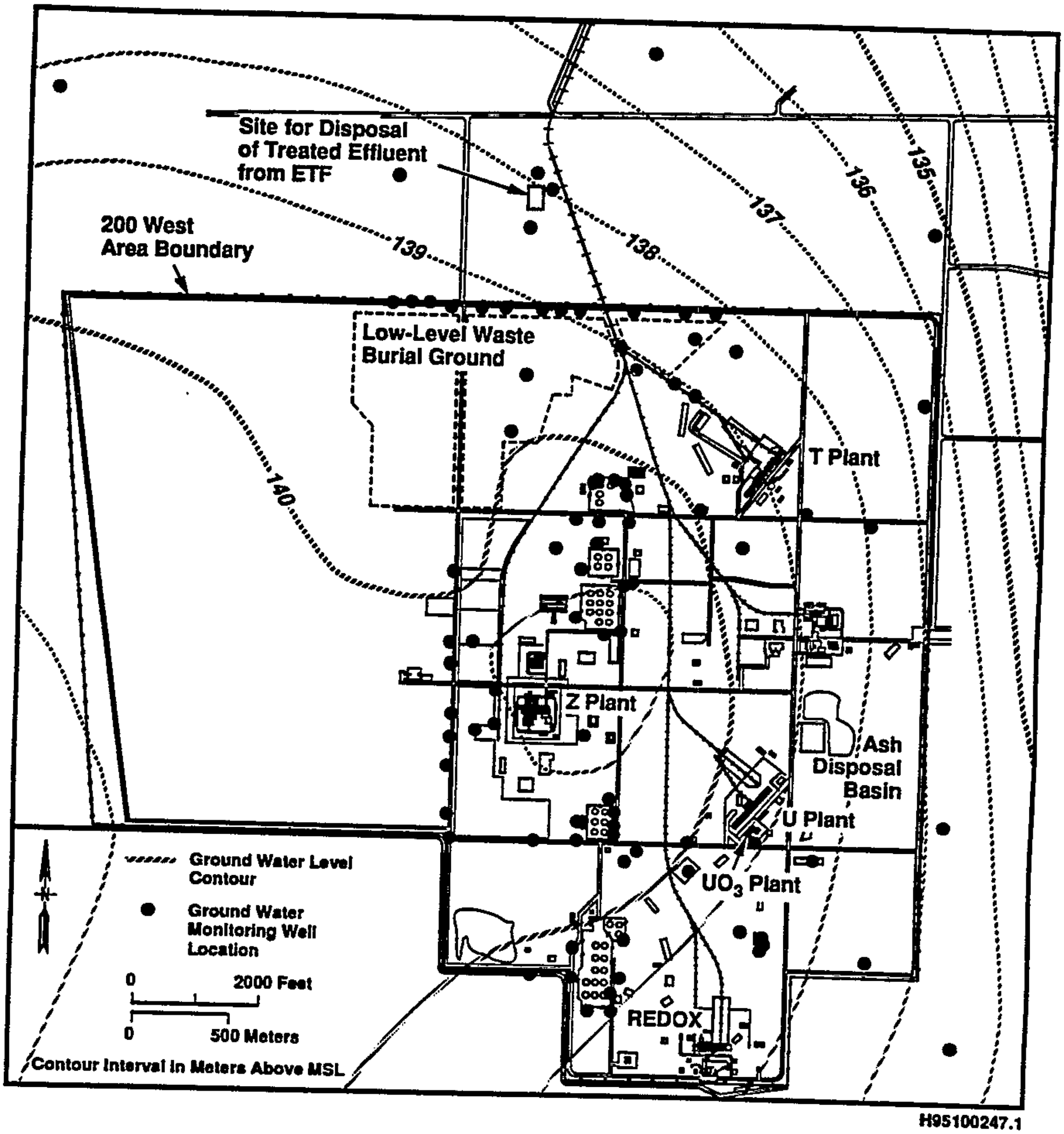


Table 2-2. Aquifer Test Results.

Test interval[a]	Test type	Discharge rate (gal/min)	K (ft/d)	T[b] (ft^2/d)
No. 1 75.53 to 78.81 m (244.37 to 258.40 ft)	Slug[c]	—	11	35
	Constant-rate pumping	21	10	530
No. 2 91.41 to 96.18 m (299.70 to 315.36 ft)	Slug[c]	—	115	—
	Constant-rate pumping	203	120	6,500
No. 3 117.24 to 122.01 m (384.40 to 400.02 ft)	Slug[c]	—	58	—
	Constant-rate pumping	157.8	32	drawdown phase = 1,290 recovery phase = 4,350

[a]Depth below land surface; all tests were performed in well 699-48-77C.
[b]Assumes aquifer thickness of ~16 m (~53 ft) for test intervals 1 and 2, and ~4.6 m (~15 ft) for interval 3.
[c]Slug rod volume = 2,404 ft^3.

The tests yielded estimates of hydraulic conductivity that range from 3 m/d (10 ft/d) in the upper part of the aquifer (test interval 1) to 37 m/d (120 ft/d) at intermediate depth in the aquifer (test interval 2).

A storativity of 0.0016 was derived during the recovery phase for test interval 1 in observation well 699-46-77D. This value is for the upper, less permeable, part of the aquifer. However, Swanson (1994a) notes that some of the data plot irregularly for this particular test and may therefore be spurious. A storativity of 0.0005 was assumed to develop type curves for analysis of data from test interval 2. This value is thought to be a reasonable estimate of the storage coefficient for locally confined aquifer conditions in the Ringold Formation. Although no specific confining horizon was identified, values for both the derived storativity and the barometric efficiencies indicate confined conditions in the uppermost aquifer beneath the facility. Confinement of the ground water beneath the facility may occur because of calcium carbonate-cemented horizons within units A and E of the Ringold Formation. These are not identifiable as distinct lithologic horizons, but may collectively confine ground water locally.

2.3.3.4 Ground-Water Flow Direction and Rate. Ground-water flow direction and rate beneath the facility can be calculated using hydraulic conductivities derived from constant-rate aquifer tests, estimated effective porosities, and hydraulic gradient calculated from water-level measurements. Average linear ground water velocity is estimated in this manner by the relationship:

$$\bar{v}=\frac{KI}{n_e}$$

where $\bar{v}$ is average linear ground water velocity, K is hydraulic conductivity, I is hydraulic gradient, and n_e is effective porosity. Effective porosity is estimated based on values thought to be typical of the Ringold Formation, and is typically assigned a value of 0.1 to 0.2.

As discussed in Section 2.3.3.3, calculated hydraulic conductivities range from 3 m/d (10 ft/d) in the upper part of the aquifer (test interval 1) to 37 m/d (120 ft/d) at intermediate depth in the aquifer (test interval 2). The calculated hydraulic gradient is 0.003, using April 1995 water-level measurements from the facility wells and other nearby wells (see Figure 2-12). Based on these values, the average linear velocity of ground water beneath the facility ranges from 0.05 to 1.1 m/d (0.15 to 3.6 ft/d); flow is generally north-northeast.

2.3.4 Ground Water Chemistry and Related Parameters

This section describes the results of chemical analyses of ground water sampled in the three site characterization/monitoring wells (see Figure 2-4) and is organized in parallel with Section 3.4 to aid in comparing pre-operation (baseline) monitoring data with monitoring data collected after initiation of disposal. The baseline results cover the period from June 1992 to July 1995. Appendix C contains all ground water chemistry data reported for that time period. These data indicate no ground-water contamination beneath the facility. The following sections describe properties of, and the occurrence of constituents in ground water beneath the facility during the baseline monitoring period.

Various methods used to evaluate data from the three wells indicate that the data are of acceptable quality. Nevertheless, ground water sample collections and analyses are subject to actual and potential anomalies and errors. The following paragraphs discuss the analyses in the context of several factors that may affect the results.

Ground water in well 699-48-77A was sampled during each of 14 quarters since well completion in 1992. Wells 699-48-77C and 699-48-77D were sampled during each of seven quarters since well completion in 1994. The results of these samplings were used to determine baseline water quality.

Purge rates for the three wells were generally consistent with pumping rates during sampling. However, when purge rates exceeded sampling rates, analytical results for some sample constituents may not have been representative of ground water in the aquifer. Potential anomalies introduced by variable purging and sampling rates were taken into consideration during evaluation of the data and are discussed later in this section. Future collections of ground water samples from these wells (see Section 3.6.1) will use purge and sampling rates that are less than or equal to the rate of pumping used for well development (ASI 1995). This measure ensures low sample turbidity and enhances representativeness of analytical results (see Sections 2.3.4.1 and 3.6).

2.3.4.1 Turbidity and Other Field Analysis Parameters. Measurements of turbidity are used to determine the relative amount of particulate matter in water. Water samples with high particulate content interfere with analytical methods and may cause analytical results to be erroneously high or low, depending on the analyte and the analytical method used. Consequently, ground water samples with low turbidity are sought. Turbidity is known to be influenced by pumping rates during purging and sampling. For ground water samples collected from the three monitoring wells between October 1993 and May 1994, turbidity was measured in the laboratory, rather than at the well site. For all other collection dates, turbidity was not analyzed or was analyzed in the field (for more recent samples). Hence, some samples were collected without prior knowledge of the turbidity of the water. The advantage of measuring turbidity prior to sample collection is that the pumping rate can be reduced as needed to achieve lower turbidity, thus helping eliminate potential interferences to laboratory analyses.

The measured turbidities were all within an acceptable range of <10 nephelometric turbidity units (NTU). Pumping rates for these sampling events were consistent with lower purge rates. Consequently, the analytical results have most likely not been significantly affected by turbidity.

The other field parameters for which measurements were made during quarterly sample collection in the three wells are specific conductance (SC), pH, and temperature. The consistency of values for the field parameters measured at each well indicates that they provide a reliable baseline for ground-water quality evaluation. Notably, an average pH of 8.1, with a range of 7.7 to 8.5, was reported for doungradient well 699-48-77D during six successive quarters of baseline data collection. Water level was also measured quarterly, and is discussed in Section 2.3.3.

2.3.4.2 Cations and Anions. Ammonia/nitrogen was detected in well 699-48-77A on October 15, 1993 and January 17, 1994. Ammonia/nitrogen was also found in the field quality control (QC) blank. Coliform bacteria were detected twice in well 699-48-77A on June 19, 1992 and September 2, 1992. Coliform bacteria were not detected in wells 699-48-77C and 699-48-77D. Sulfide was not detected in wells 699-48-77C or 699-48-77D, and was not analyzed in well 699-48-77A. Hydrazine was not detected in well 699-48-77A and was not analyzed in wells 699-48-77C or 699-48-77D. All detections were in the low-level range and are considered to be baseline values for the disposal facility.

Samples were collected for analysis of cations, anions, alkalinity, total carbon (TC), total dissolved solids (TDS), and SC to provide information for evaluating water quality parameters and charge-balance equations. Because charge balance can be used to verify sampling and laboratory analysis precision and accuracy, attempts were made to assess the relationships of charge balance to TDS and SC. However, these attempts did not consistently indicate correlations.

The relationship of TDS to major cations and anions is as follows:

$$TDS\ (\mu g/L) = \Sigma(cations + alkalinity\ (0.6) + anion)\mu g/L.$$

If alkalinity analyses are not available, then TC and total organic carbon (TOC) may be used to calculate alkalinity indirectly by the relationship:

$$(TC - TOC)\ x\ 4 = Alkalinity.$$

This relationship is based on the assumption that total inorganic carbon (TIC) is equal to TC minus TOC. TIC is expressed as an equivalent concentration of calcium carbonate ($CaCO_3$).

The relationship of TDS to SC is as follows:

$$TDS\ (\mu g/L) = SC\ (\mu mohs/cm) + 1.7.$$

Charge balance, the calculated percent deviation between the observed total cations and anions (each measured in milliequivalent (meq)/L), can be determined by using the following equation:

$$Charge\ balance = \frac{total\ cations - total\ anions}{total\ cations + total\ anions}\ x\ 100\%$$

where:

$$Total\ cations\ (meq/L) = \frac{[NA^+]}{22.9898} + \frac{[K^+]}{39.102} + \frac{[Ca^{+2}]}{20.04} + \frac{[Mg^{+2}]}{12.156}$$

and

$$Total\ anions\ (meq/L) = \frac{alkalinity}{50} + \frac{[Cl^-]}{35.453} + \frac{[F^-]}{18.9984} + \frac{[NO_3^-]}{62.0049} + \frac{[SO_4^{-2}]}{48.0308} .$$

Concentration units in these equations are milligrams per liter; the divisors are the equivalent weights of the respective species. A charge balance can be computed provided that data for all of the key components are available. Key components include sodium, potassium, calcium, magnesium, alkalinity, chloride, fluoride, nitrate, and sulfate. If results for nitrate are available, they are included in the charge-balance calculation but are not quantitatively significant. Consequently, a charge balance typically is determined whether nitrate analyses are available or not.

Alkalinity was not measured nor was it calculable from TC, because TC was not analyzed. Based on evaluation of the relationship of SC to TDS, a $< \pm 21\%$ difference was observed between analyzed and calculated TDS. Laboratory measured TDS values were consistently higher than the TDS estimated from field-measured SC.

Evaluation of the chemical analysis data, based on cation and anion information, indicates that the analyses are of acceptable quality. No anomalous values were noted, and the ground water in all three monitoring wells currently complies with all primary drinking water standards.

2.3.4.3 Metals and Cyanide. Evaluation of metals analyses was in terms of the comparability of results for filtered and unfiltered samples. If the results for filtered vs. unfiltered samples agreed within 20%, the data were considered to be acceptable. If the results did not agree within the limits of this criterion, the disagreement was attributable to high turbidity resulting from well construction or sampling techniques.

Only two outlying analyses were observed for samples from well 699-48-77A. On May 17, 1993, copper in the filtered sample was twice as high as that in the unfiltered sample. On September 2, 1993, potassium in the unfiltered sample was twice as high as that in the filtered sample.

Data from well 699-48-77A showed no correlation between aluminum, chromium, iron, manganese, vanadium, and zinc values for filtered versus unfiltered samples. This same lack of correlation is seen for ground water samples throughout the Hanford Site and can be attributed to well construction, sampling, and analytical errors. Consequently, analytical data from both filtered and unfiltered samples will be used to evaluate future analytical data for metals.

In wells 699-48-77C and 699-48-77D, filtered and unfiltered samples were collected for metals analysis. Analytical results from the wells were compared to historical values from other monitoring wells on the Hanford Site. The analytical results were very consistent for filtered samples, except for the following three outlying values: Well 699-48-77C had two outlying results for manganese and zinc in a sample collected on August 10, 1994; well 699-48-77D had one outlying result for manganese in a sample collected on August 10, 1994.

Analyses were made for cyanide in well 699-48-77A until October 1993; thereafter, samples were not analyzed for cyanide in any of the three wells. Cyanide was not detected in any of the samples.

Appendix C provides additional information on cyanide, cations, anions, and metals.

2.3.4.4 Organic Compounds. Analyses of organic compounds focused on both specific constituents and broad-based indicators. Analyses were made of total organic halides (TOX), TOC, volatile organic compounds, semivolatile organic compounds, phenols, pesticides, polychlorinated biphenyls (PCB), herbicides, dioxin/dibenzofurans and organophosphates. The relationships between the detection of specific constituents, and TOC and/or TOX were reviewed. Audits of laboratory analyses and reporting suggest that the results of TOX analyses from December 1992 to December 1993 should be treated as suspect. After December 1993, TOX was analyzed by a different laboratory for which audit results have been more satisfactory.

Specific organic compounds were below the laboratory contractual reporting limits for all sampling dates and wells. The following are the only detections of organic compounds. The number or other entry in parentheses after the name of the organic compound indicates the number of detections (if more than one) or the type of laboratory error. Refer to Appendix C.3 for additional details of analyses for organic compounds.

- Well 699-48-77A: acetone (blank contaminated) and cis-1,2-dichloroethylene were detected
- Well 699-48-77C: methylene chloride (2, blank contaminated), 4,4'-DDE, aldrin, carbon tetrachloride (2), chloroform (2) and di-n-butylphthalate were detected
- Well 699-48-77D: 1,1,1-trichloroethane, methylene chloride (2, blank contaminated), carbon tetrachloride (2), chloroform (2), and di-n-butylphthalate were detected.

2.3.4.5 Radionuclides. Radionuclides are being monitored in ground water at the three monitoring wells to establish baseline values. All detections have been at low levels. Iodine-129, among the most mobile of radionuclides found in ground water elsewhere beneath the Hanford Site, was detected once in well 699-48-77A and was not analyzed for wells 699-48-77C or 699-48-77D. Tritium was detected twice in each of wells 699-48-77C and 699-48-77D. Gross alpha and gross beta are currently monitored in all wells. Gross beta was detected for samples collected in well 699-48-77C (25 times higher than historical results) and well 699-48-77D (10 times higher than historical results) on August 10, 1994. Radium was analyzed only for samples from wells 699-48-77C and 699-48-77D, with one detection at each well.

2.3.5 Statistical Evaluation of Ground Water Background Data

Twelve quarters of monitoring data from well 699-48-77A and four quarters of monitoring data from wells 699-48-77C and 699-48-77D were statistically evaluated to derive background values representative of pre-operational ground-water quality for the three monitoring wells at the disposal facility. Background concentrations in ground water are statistically defined as the 95% upper tolerance interval, with 95% confidence. These background concentrations represent conditions present in the uppermost aquifer prior to the onset of discharges to the facility. The assumptions, objectives, and approach used for the statistical evaluation are described in the following sections.

2.3.5.1 Assumptions. Assumptions related to the statistical model or methods are required to properly determine and interpret background values for constituents of interest in ground water at the disposal facility. These assumptions include the following:

- Ground-water monitoring data are representative of actual ground water conditions in the uppermost aquifer beneath the facility.
- Ground water chemistry data, except for pH and SC, are log-normally distributed. The use of a log-normal distribution as a default statistical model is justified because (1) most ground-water monitoring data are positively skewed and are restricted to positive values, (2) all available statistical tests for distributional assumptions are inadequate when the sample size is small, and (3) the U.S. Environmental Protection Agency's (EPA) experience with contaminant concentration and ground-water monitoring data suggests that a log-normal distribution is generally more appropriate as a default statistical model than a normal distribution (EPA 1992). For field-measured pH and SC data, normal distributions are assumed because each data point is the average of quadruplicate measurements (i.e., the central limit theorem applies in this case).
- Seasonal or temporal variations are insignificant. The test for seasonality generally requires a minimum of 2 yr of monitoring data. The data from the two downgradient wells are insufficient to test and/or adjust for seasonal variation.

2.3.5.2 Objectives. Objectives of the statistical evaluation were to (1) establish baseline values for constituents of potential concern at each of the three monitoring wells and (2) provide information to enable Ecology to determine enforcement limits for specific constituents in ground water. Enforcement limits are established for specific constituents of concern to delineate ground-water contamination. Enforcement limits are determined on a site-specific basis and are based in part on background concentrations of the constituents in ground water.

2.3.5.3 Statistical Approach. In general, background ground water data were statistically evaluated following procedures outlined by the EPA (1989, 1992).

Ground water chemistry data from the three monitoring wells (699-48-77A, 699-48-77C, and 699-48-77D) were obtained from the Geosciences Data Analysis Toolkit (GeoDAT) and Liquid Effluent Monitoring Information System (LEMIS) databases. Analytical results were evaluated according to guidelines of the RCRA Quality Assurance Project Plan (Stauffer 1995). Data flagged with 'B' (contaminated blank) or 'H' (holding time exceeded) qualifiers were eliminated from further statistical evaluation because the validity of such data is doubtful. However, the usefulness of data flagged with a 'Q' qualifier (result associated with suspect QC data) was evaluated based on consistency with the historical trend because this flag only indicates the existence of a potential problem that may affect quality.

Ground water chemistry results from each monitoring well were screened by visual inspection and tested at the 5% level of significance for outlying values using Box-and-Whisker plots and the Grubbs method, respectively (EPA 1989). The data were not used to calculate background concentrations if they were determined to be outlying values.

Ground-water monitoring data are often reported as "not detected." In these instances, a value such as the appropriate method-detection limit is given, accompanied by a "U" qualifier. Statistical treatment of data reported as not detected depends on their percentage in the database.

When the percentage of results below the detection limit is small (<15%), a replacement value of 1/2 the detection limit is used for the below-detection data point (e.g., chromium data from well 699-48-77A [see Appendix C.2]). When the percentage of data entries below the detection limit is between 15 and 50%, Cohen's method will be applied to the log-transformed data values to calculate estimates of the true mean and standard deviation (EPA 1989). When the percentage of data entries below the detection limit is larger than 50%, summary statistics (sample mean and standard deviation) are not calculated. For gross alpha, gross beta, and tritium, adjustments for data reported as not detected are not made (e.g., Cohen's method) because actual activity levels are reported. Hence, there is no data censoring problem from a statistical point of view.

A 95% upper tolerance limit and a confidence level of 95% based on log-normal distribution were used to calculate background concentrations. For pH, a two-sided tolerance limit based on normal distribution was calculated. For SC, a one-sided tolerance limit, based on normal distribution, was calculated. These tolerance limits are of the form:

$$\bar{x} + ks \quad \text{(one-sided)}$$

$$\bar{x} \pm ks \quad \text{(two-sided),}$$

where $\bar{x}$ is the sample mean, s is the sample standard deviation, and k is a multiplier whose value is based on the coverage, confidence level, and sample size. Values of k can be obtained from the EPA (1989).

The tolerance interval is designed to cover only a specific proportion (e.g., 95%) of the population of interest. Therefore, 1 of 20 samples could be expected to exceed the upper tolerance limit, even when no contamination has occurred (EPA 1992). In such cases, a well would be resampled to verify the presence or absence of contamination.

2.3.5.4 Results of Statistical Evaluation. Background ground-water characteristics were evaluated for each well using data collected from June 1992 through July 1995. A summary of the status of all constituents of potential concern and the tolerance limits are provided in Appendix D.1. Additional statistics and conditional statements associated with computation of the tolerance limits listed in Appendix D.1 are provided in Appendix D.2.

2.3.6 Sediment Characterization

Physical and chemical properties of sediments at the disposal facility were first described by Reidel and Thornton (1993). The results of that study, except for grain size analyses, are for samples collected during the drilling of wells 699-48-77A and 699-48-77B.

Swanson (1994a) reported the results of analyses of split-spoon and grab samples collected from two subsequently drilled wells, 699-48-77C and 699-48-77D. These samples were analyzed only for moisture and $CaCO_3$ contents. In addition, in-situ infiltration tests were conducted at two locations immediately south of the disposal facility to measure infiltration capacity and hydraulic conductivities of near-surface sediments (Swanson 1994b). These tests were conducted in two shallow boreholes to determine whether $CaCO_3$-cemented horizons in the sediments beneath the disposal site would hinder facility operation (Section 2.3.6.2).

The discussions that follow summarize results of the characterization work identified previously. Detailed descriptions of the sediments can be found in the borehole data package for the facility (ASI 1995).

2.3.6.1 Physical Properties of Sediments. Grain-size distributions within Ringold units A and E, the units that collectively comprise most of the sediments beneath the disposal facility, were measured in samples from well 699-48-77A. However, because of the diminution of grain sizes caused by the cable-tool method used to drill this well, the results may not be representative. For purposes of comparison, grain-size distributions were also determined for sediment cores taken from three rotary-drilled boreholes south of the disposal facility (DH-6, DH-12, and DH-13; see Figure 2-5 for locations). These samples were from Ringold units A and E, and interbeds of silt and sand within the Ringold Formation. Sampling results from all four wells were expressed by Reidel and Thornton (1993) in terms of the Wentworth grain-size classification system (Krumbein and Pettijohn 1938).

Grain-size distributions were determined for 18 samples from well 699-48-77A. A sample of the Hanford formation from this well at a depth of 1.4 to 1.5 m (4.5 to 5.5 ft) indicates that pebble-sized grains comprise ~48% of the formation. In contrast, medium-to-very coarse sand comprises an average 49% of strata identified as the Plio-Pleistocene unit and/or early "Palouse" soil. This average is based on grain-size measurements for 12 samples from depths of 8.1 to 16.6 m (26.5 to 54.4 ft). Because 21% of these samples is silt, the average grain-size distribution in the Plio-Pleistocene unit and/or early "Palouse" soil appears to be bimodal.

The only sample analyzed from the upper unit of the Ringold Formation is dominated by medium-to-very coarse sand. This sample was taken at depths of 20.6 to 20.7 m (67.5 to 68.0 ft). Based on the average of four samples analyzed from the Ringold unit E, the dominant grain size of this unit is pebble-to-granule (56.5%). Grain-size distributions in the Ringold unit A were not measured for samples from this well. Clay-sized particles are reported as being present only in "trace" amounts for all units.

Grain-size distributions were also measured in 47 samples from wells DH-6, DH-12, and DH-13, all south of the disposal facility in the 200 West Area (see Figure 2-5). The average grain-size distribution for 26 of these samples from the Ringold unit E indicates that 75% of the particles comprising the sediment are of pebble size. Most of the remaining samples from Ringold unit E are classified as medium-to-very coarse sand. The average for 10 samples from Ringold unit A indicates that 71% of the particles comprising this unit are of pebble size; 11% are medium sand. Twelve samples from sand and silt interbeds within the gravels indicate that the dominant grain sizes in these lithologies are fine-to-medium sand (63%), and that an average of only 3.8% silt is present. As was the case in well 699-48-77A, only a trace of clay was noted, on average, for samples from these three wells.

$CaCO_3$ content was analyzed for 1.5-m (5-ft) sample intervals in wells 699-48-77A and 699-48-77D (WHC 1995). The results of most analyses indicated that $CaCO_3$ is present in amounts less than 0.5%, except within the Plio-Pleistocene unit and/or early "Palouse" soil. In well 699-48-77A, as much as 7.8% $CaCO_3$ is estimated to be present within these two strata. In well 699-48-77D, 8.5% $CaCO_3$ is present near the contact separating the Hanford formation from the Plio-Pleistocene unit and/or early "Palouse" soil; 8.7% $CaCO_3$ is present in these strata near their contact with the Ringold Formation.

2.3.6.2 Results of Infiltration Tests. Geologic logging of monitoring well 699-48-77A revealed a substantial thickness of relatively impermeable sediments, now identified as the Plio-Pleistocene unit and/or early "Palouse" soil. These strata occur ~6 to 20 m (~20 to 65 ft) below the surface at the disposal facility. The presence of these fine-grained, $CaCO_3$-cemented sediments was a cause of potential concern for the infiltration of treated effluent because these sediments have relatively low hydraulic conductivities. Consequently, in June 1994, two shallow boreholes were drilled near the southern end of the facility to test the infiltration rate (see Figure 2-4). Falling-head and constant-head tests were conducted in each borehole.

Tests in the eastern borehole yielded a hydraulic conductivity (constant-head test) of 1.0×10^{-3} cm/sec (3 ft/d) and an infiltration rate (falling-head test) of 0.9 L/d/m^2 (2.5 gal/d/ft^2). The hydraulic conductivity derived from the constant-head test in this borehole is not consistent with the infiltration rate derived from the falling-head test. The value from the constant-head test was interpreted to be suspect because of a possible leak in the casing shoe at the bottom of the borehole.

Two falling-head tests were conducted in the western borehole. These tests yielded infiltration rates from 17.6 to 66.8 L/d/m^2 (50 to 190 gal/d/ft^2). The single, constant-head test in the western borehole produced a hydraulic conductivity of 2.7×10^{-3} cm/sec (7.4 ft/d).

Swanson (1994b) attributed the discrepancies in results from the two boreholes to lateral and vertical discontinuities in the distribution of calcrete in the Plio-Pleistocene unit and/or early "Palouse" soil. It was also noted that the much 'softer' calcrete encountered in the western borehole suggests significant lateral variability in the degree of induration and/or $CaCO_3$ content. This lateral variability in cementation may be favorable for facility operation because effluent may infiltrate more effectively through the weakly- or non-cemented areas.

2.3.6.3 Sediment Chemistry. Seven samples of sediments from two boreholes were chemically analyzed; four from well 699-48-77A and three from abandoned borehole 699-48-77B (see Section 2.3.1) (Reidel and Thornton 1993). Each sample was analyzed for metals, anions, pH, radionuclides, volatile organic compounds, semivolatile organic compounds, pesticides and PCBs, and hexavalent chromium. Eight additional samples from well 699-48-77A were the subject of column leach tests. Four samples of leachate were analyzed from each of the eight samples.

Results of the analyses indicate the sediments contain none of the analytes identified in the preceding paragraph at levels indicative of contamination. The results of most analyses of nonmetals were at or below detection limits of the analytical method. Relatively high values for pH (9.0 to 9.4) result from the calcareous nature of the sediments. Trace amounts of two volatile organic compounds (2-butanone and 4-methyl-2-pentanone) were found in the analyses for volatile organic compounds. Similarly, traces of three semivolatile compounds, benzoic acid, carboxylic acids, and phthalates were identified in the sediments.

Column leach tests were conducted to determine if potentially pre-existing contaminants in the sediments could be leached by treated effluent, thus affecting ground-water quality. The tests consisted of draining deionized water through core samples of sediments. The resulting leachate was analyzed for nonorganic constituents. All analytes of potential concern were at or below detection limits. Nitrate in one sample was elevated (42.7 mg/L) but still below drinking water standards. Calcium content and pH were also slightly elevated because of $CaCO_3$ in the sediments.

In summation, no constituents of concern were detected at significant levels in the sediments or leachates of the sediments. Elevated alkalinity is thought to result from the $CaCO_3$ in the sediments.

2.4 PROJECTED EFFECTS OF FACILITY OPERATION ON GROUND-WATER FLOW AND SOLUTE TRANSPORT

Ground-water flow characteristics in the vicinity of the disposal facility and the fate of tritium discharges were evaluated by using computer-encoded numerical models. These models were used to simulate infiltration of the discharge into the vadose zone and its subsequent movement in the uppermost aquifer. This section summarizes results of the following analyses:

- Hydrogeologic modeling of hydraulic properties and water quality in the uppermost aquifer underlying the 200 West Area and vicinity (Connelly et al. 1992)
- Numerical analysis of treated effluent flow and tritium transport in the vadose zone beneath the disposal facility (Lu et al. 1993)
- Numerical analysis of ground-water flow and tritium transport in the uppermost aquifer between the disposal facility and the Columbia River (Golder Associates 1990, 1991).

Connelly et al. (1992) comprehensively reviewed ground-water flow characteristics in the 200 West Area and selected adjacent areas. They also compiled information on the extent and nature of existing ground-water contamination associated with past operations in the 200 West Area. The numerical simulations by Lu et al. (1993) evaluated the potential for preferential lateral movement of treated effluent in the vadose zone above the uppermost aquifer, and predicted the distribution of tritium in the immediate vicinity of the discharge. Numerical modeling by Golder Associates focused on (1) prediction of movement through the uppermost aquifer to the Columbia River of tritium discharged to the facility and (2) estimation of future tritium concentrations in ground water entering the river.

2.4.1 Modeling of Hydraulic Properties and Known Ground-Water Contamination in the 200 West Area and Vicinity

This section summarizes work by Connelly et al. (1992) that is pertinent to evaluating baseline water quality and hydrology in the vicinity of the disposal facility, distribution of ground water contaminated by past operations in the 200 West Area, and movement of ground water through the uppermost aquifer in the northern portion of the 200 West Area.

2.4.1.1 Known Ground-Water Contamination. Contaminant plume geometries and distributions associated with past operations in the 200 West Area were compiled and plotted by Connelly et al. (1992) based on data in the Hanford Environmental Information System (HEIS) database through the first half of 1990. As used by Connelly et al. (1992), the term "contaminant" refers to any constituent listed in:

- WAC 173-200-040, *Model Toxics Control Act*
- 40 CFR 141 and 143, *Primary and Secondary Drinking Water Regulations*
- FR 54 22062, *Proposed Drinking Water Maximum Concentration Limits*
- 40 CRF 264, Appendix IX
- DOE Order 5400.5, *Derived Concentration Guides for Radionuclides*.

Data on contaminant concentrations that exceeded the limits stated in the above regulations were compiled and their distributions contoured by computer to indicate the approximate extent of the contamination. A composite distribution map of hazardous chemicals, for concentrations in ground water that exceed regulatory limits, is shown in Figure 2-13. This map shows the areas of the uppermost aquifer in the 200 West Area that are contaminated by past discharges of arsenic, chromium, fluoride, carbon tetrachloride, chloroform, trichloroethylene, and nitrate. Figure 2-14 is a map of the areas of the uppermost aquifer with radionuclide contamination from iodine-129, plutonium 239/240, technetium-99, tritium, and uranium.

2.4.1.2 Pre-Operational Movement of Water through the Uppermost Aquifer in the 200 West Area and Vicinity. The uppermost, regionally unconfined aquifer beneath the disposal site and most of the 200 West Area is in Ringold Formation gravel units A and E. As shown in Figure 2-15, hydraulic properties of this aquifer vary widely. However, the northern part of the 200 West Area, including the vicinity of the disposal facility, is distinguished by a zone of relatively high hydraulic conductivity (>30 m/d [>100 ft/d]). This high-conductivity zone is believed to trend north-south between the area immediately west of the disposal site and the LLWBG.

The potential movement of contaminants in the uppermost aquifer (Connelly et al. (1992) is illustrated by the streamlines in Figure 2-15. The simulated rate of ground-water movement varies among areas of the aquifer with differing hydraulic conductivities. The time markers shown on the streamlines in the figure illustrate the relative differences in the rates of ground-water movement for areas with differing hydraulic conductivities. Hydraulic head conditions for 1992 in the high conductivity zone shown in Figure 2-15 would result in ground water traveling ~610 m (~2,000 ft) in 3 yr.

2.4.2 Numerical Analysis of the Effects of Facility Operation on the Vadose Zone

This section summarizes work by Lu et al. (1993) to simulate the movement of discharges to the disposal facility through the vadose zone. The simulation was made using the VAM3D-CG numerical model (Huyakorn and Panday 1991).

2.4.2.1 Conceptual Model. The conceptual model of Lu et al. (1993) assumed that infiltration of treated wastewater into the soil would occur through a surface area of 2,000 m^2 (21,600 ft^2) at a rate of ~150 $m^3/yr/m^2$ (400 $L/d/m^2$ [10 $gal/d/ft^2$]), that half the tritium would decay by the end of each 12.3 yr period, and that tritium concentrations would be unaffected by sorption. Lu et al. (1993) also assumed that 568 L/min (150 gal/min) of wastewater would be continuously discharged for 125 yr and that the water would contain tritium with an average concentration of 1.62E+07 pCi/L. In a subsequent analysis, the estimated discharge rate was increased by 8 L/min (22 gal/min) and the expected concentration of tritium was revised substantially downward to 6.2E+06 pCi/L. The actual design life of the facility is 30 yr.

The VAM3D-CG numerical model simulated advection, hydrodynamic dispersion, and radioactive decay in a two-dimensional vertical cross section from the surface to a depth of 120 m (395 ft) in a vertical plane cutting across the center of the infiltration surface. The discharge to the facility was represented in the conceptual model by applying the treated effluent as a constant flux along a 32 m (105 ft) length of the top surface of the vertical plane. Beyond the 32-m (105-ft) influx length, the model domain extended 50 m (165 ft) upgradient along the plane of the cross section and 100 m (328 ft) downgradient, for an overall length of 182 m (600 ft).

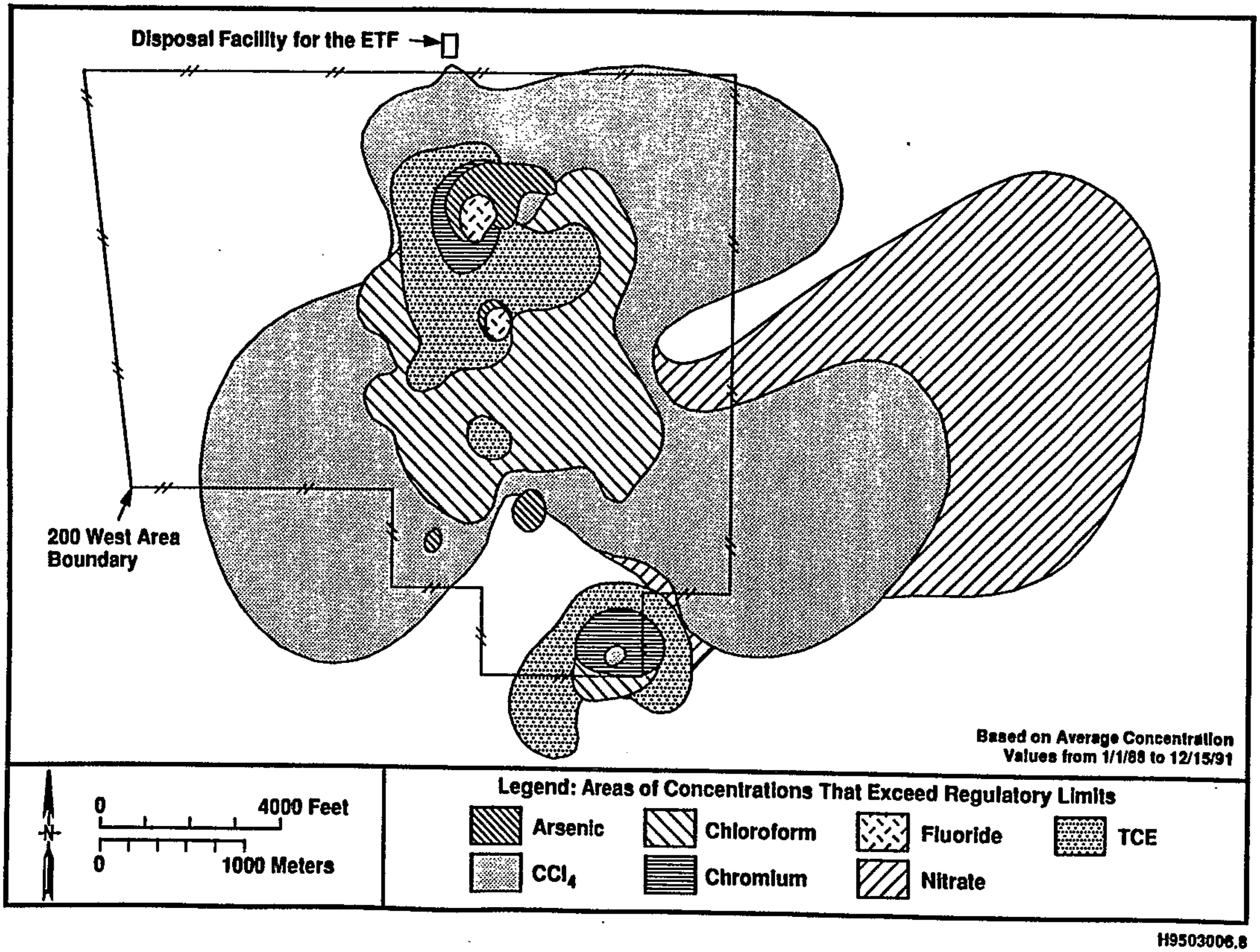


Figure 2-13. Hazardous Contaminant Distributions in the Uppermost Aquifer.
(after Connelly et al. 1992)

Figure 2-14. Radioactive Contaminant Distributions in the Uppermost Aquifer. (after Connelly et al. 1992)

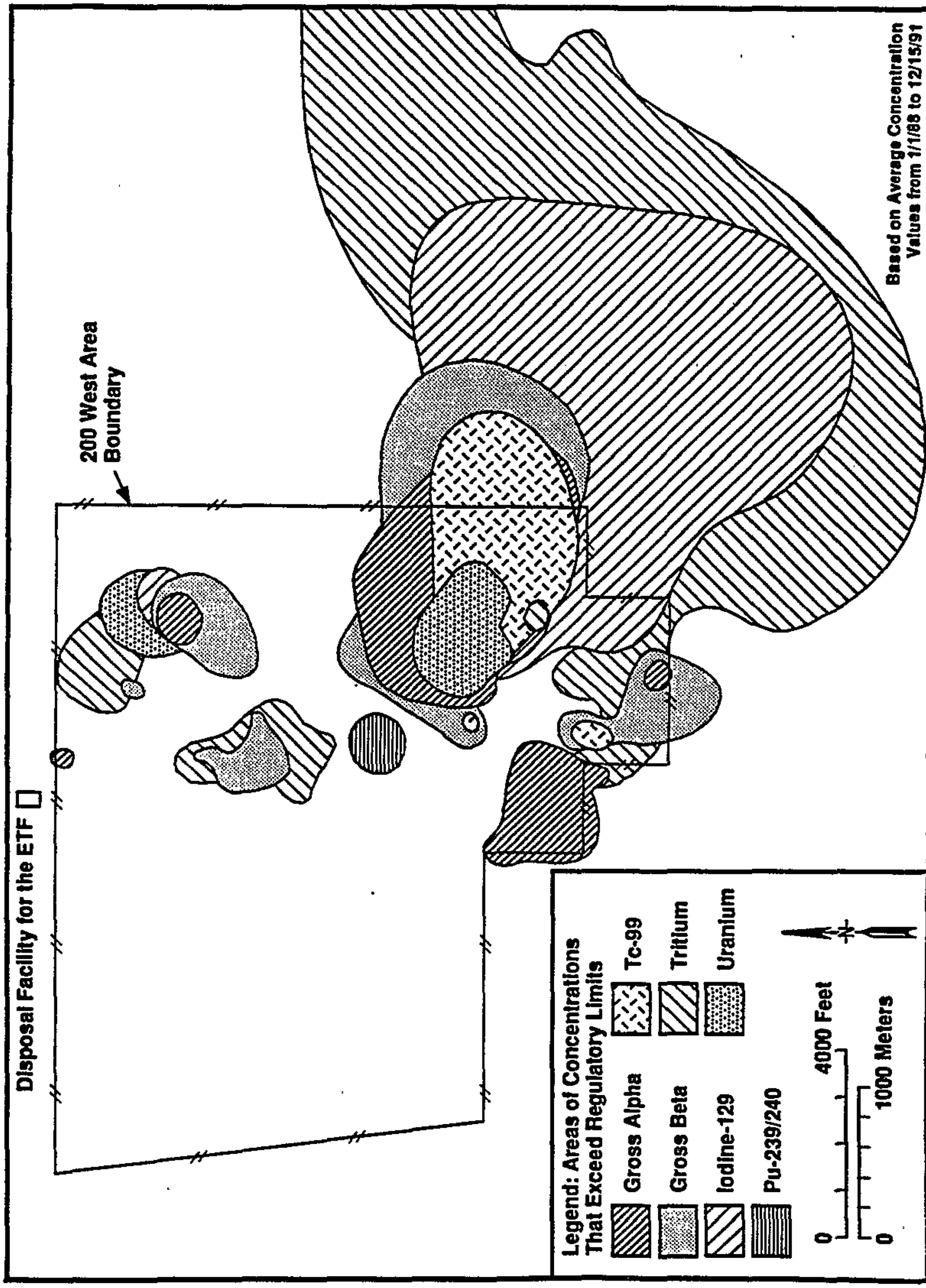


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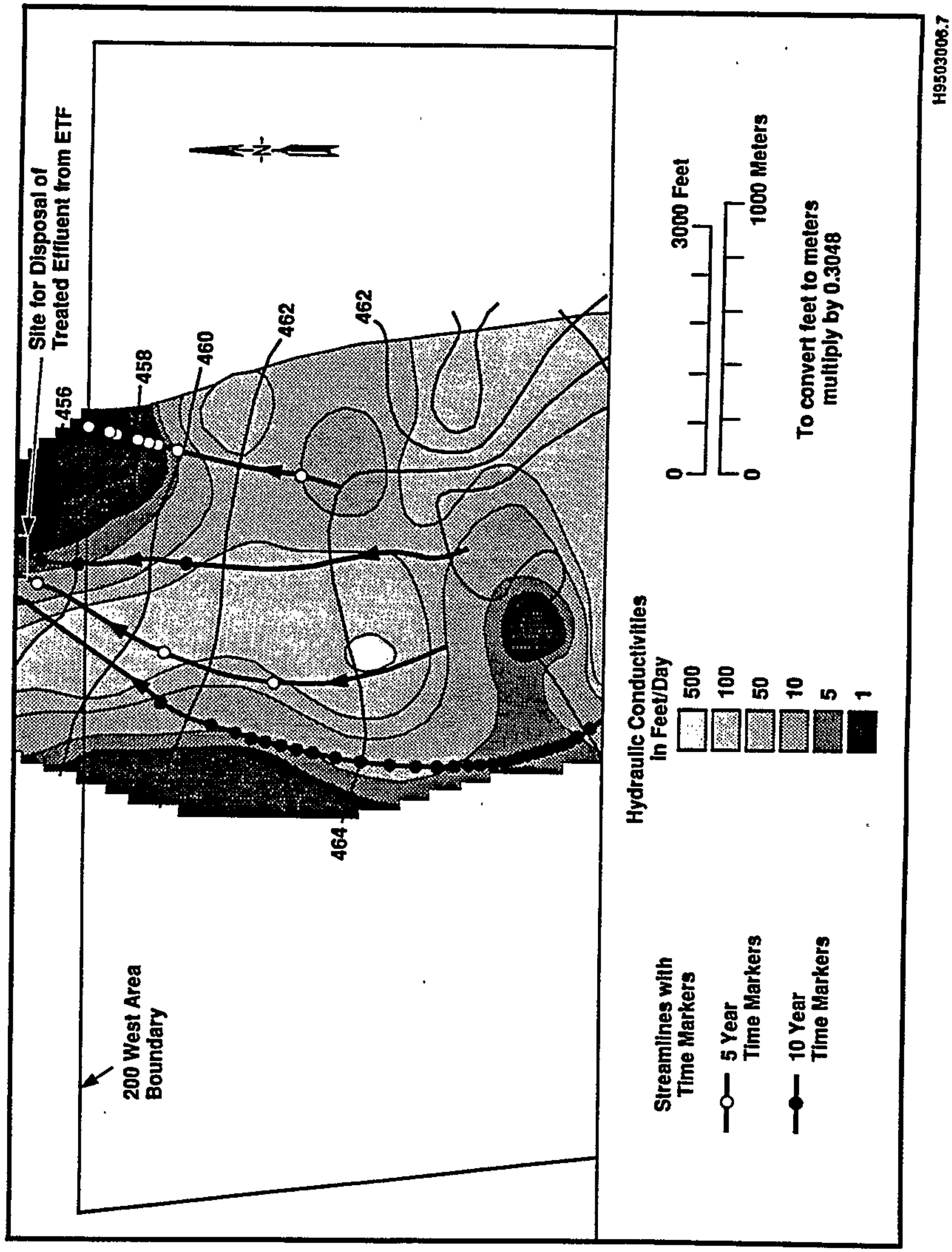
Figure 2-15. Hydraulic Conductivities, Water Table Elevations, and Streamlines with Time Markers. (after Connelly et al. 1992)



Based on the stratigraphy in the upgradient monitoring well (699-48-77A), Lu et al. (1993) depicted lithologies in the conceptual model by six zones which correspond to the Hanford formation, Pliocene-Pleistocene unit, upper part of the Ringold Formation, and portions of the middle and lower parts of the Ringold Formation. The hydraulic properties assigned to these zones were based on laboratory analyses of six split-spoon samples of sediments from the well.

Moisture characteristic curves were developed for each of the six samples by using laboratory measurements of matric potential at different moisture contents and fitting a moisture retention curve using the RETC computer program (van Genuchten et al. 1991) that embodies the van Genuchten-Mualem model for moisture retention (Mualem 1976; van Genuchten 1978). RETC was also used to estimate unsaturated hydraulic conductivity values from the moisture retention data and laboratory-measured saturated hydraulic conductivities.

Initial conditions in the vadose zone were assumed by Lu et al. (1993) to be controlled by steady-state infiltration of meteoric water at a rate of 5 cm/yr. An initial unit-gradient pressure head was assigned to the vadose zone, thus equating the initial infiltration rate to the unsaturated hydraulic conductivity.

The lateral boundaries of the model domain within the vadose zone above the water table were assigned zero fluid and solute concentration fluxes. Zero flux conditions were also assigned to the bottom boundary. The boundary condition of the saturated portion of the conceptual model was defined by applying a hydrostatic pressure distribution along boundary nodes below the current 70 m (230 ft) depth of the water table. A lateral hydraulic gradient of 2.75 m/km (14.5 ft/mi) was assigned to the uppermost aquifer by applying slightly higher pressures on the upgradient side of the model domain.

2.4.2.2 Input Parameters. The following values were used as model input parameters:

- Aquifer storativity: 0.2
- Longitudinal dispersivity: 1.0 m (3.3 ft)
- Transverse dispersivity: 0.1 m (0.33 ft)
- Molecular diffusion coefficient: 1.4×10^{-6} cm^2/s
- Sorption coefficient for tritium: 0.0
- Retardation factor for tritium: 1.0

2.4.2.3 Results. The results of Lu et al. (1993) confirm that the relatively low hydraulic conductivity of the fine-grained Plio-Pleistocene unit and early "Palouse" soil would result in lateral spreading of the treated effluent in the sediments above the water table. Lu et al. (1993) predicted that the maximum transverse flow would occur at a depth of ~10 m (~33 ft), but that lateral flow would not necessarily result in extensive migration of the treated effluent in the vadose zone to areas of high hydraulic conductivity. One such area of higher hydraulic conductivity occurs to the west of the disposal site where the Hanford formation may have been deposited in a Pleistocene paleochannel eroded into the Ringold Formation (see Figure 2-15).

Approximately 1 yr after operation of the disposal facility begins, Lu et al. (1993) predicted that the water table beneath the facility would reach its maximum elevation at ~5 m (16 ft) above the pre-operational level. The model predicted that a new steady-state condition would be established ~14 yr after operation of the facility begins. After 14 yr, no additional lateral spreading of the treated effluent in the vadose zone was predicted. When discharges end, ~5 yr would be required for the water table to revert to a pre-operational state, and for the mound in the water table beneath the facility to dissipate.

Lu et al. (1993) estimated that the treated effluent would reach the water table ~1 yr after discharge begins and would require ~9 yr from the onset of treated effluent disposal to arrive at a hypothetical well 100 m (328 ft) downgradient. Maximum predicted activity of tritium in the uppermost aquifer would be equal to the activity at the point of discharge minus the radioactive decay of tritium occurring in 1 yr. For the tritium discharge used by Lu et al. (1993) (16.2 μCi/L [1.62E+07 pCi/L]), the maximum activity would correspond to ~14 μCi/L. After ~19 yr of facility operation, the forecast maximum activity would arrive at a steady-state location in the uppermost aquifer, ~20 m (65 ft) downgradient from the location of treated effluent entry into the aquifer. However, more extensive lateral spreading may occur in preferred directions (e.g., north-south in the area immediately west of the facility) if hydraulic conductivity is appreciably anisotropic.

2.4.3 Numerical Analysis of the Effects of Facility Operation on the Uppermost Aquifer

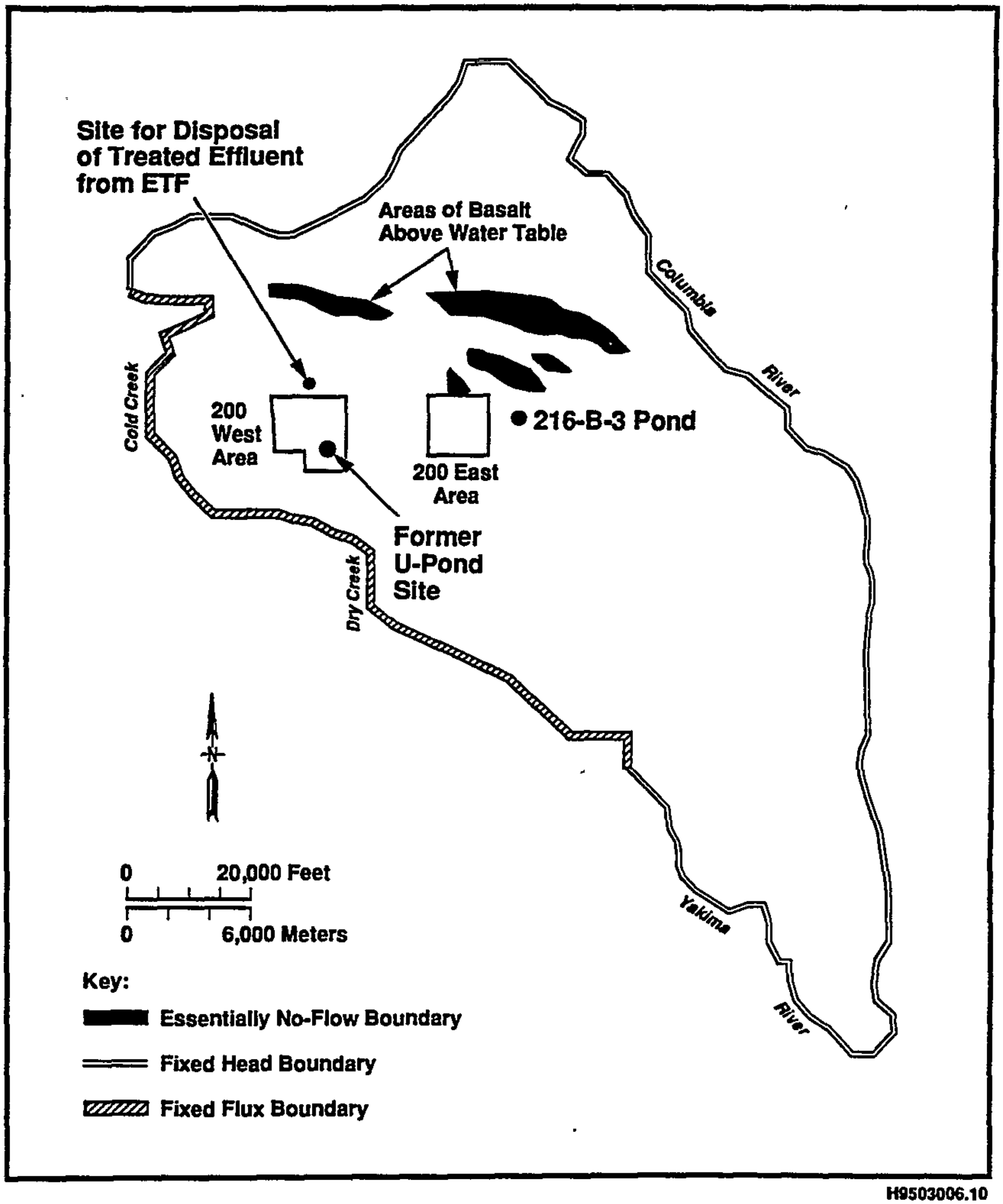
Golder Associates (1991, 1990) assessed the movement of treated effluent in the uppermost aquifer between the disposal site and the Columbia River. The analysis had two principal objectives. The first was to predict the direction and rate of movement through the uppermost aquifer of tritium discharged to the disposal facility and the second was to estimate resulting future concentrations of tritium in ground water entering the Columbia River.

2.4.3.1 Conceptual and Numerical Models. Golder Associates used their proprietary, two-dimensional software models, Aquifer Porous Media (AFPM) and Solute Transport (SOLTR) for the analysis. Detailed descriptions of the conceptual and numerical models, and discussions of the calibration procedures, assumptions, and model limitations can be found in Golder Associates (1990, 1991). The major assumptions, simplifications, uncertainties, and limitations of the AFPM and SOLTR transport models were:

- Vertical flow and solute transport within the aquifer were not accounted for
- Assumed isotropic flow characteristics for the aquifer
- Used vertically averaged hydraulic conductivities
- Used deterministically approximated flow parameters
- Used a single dispersivity value characteristic of long-distance flow
- Assumed the size and geometry of the effluent influx area at the water table
- Assumed steady-state influx from flow sources for the duration simulated
- Accuracy was reduced by numerical dispersion and oscillations
- Effects of transient changes in river elevation were neglected
- Solute transport portion of the model was uncalibrated.

Fixed-head conditions were applied to the portion of the model boundary defined by the Columbia and Yakima rivers (Figure 2-16). A no-flow condition was imposed at the bottom of the uppermost aquifer (i.e, at the bottom of the model domain). Where basalt bedrock occurs above the water table, the model boundary was assigned an extremely low hydraulic conductivity (i.e., 8 orders of magnitude less than the aquifer). A non-zero, fixed-flux condition was applied at the segment of the model boundary defined by the Dry Creek and Cold Creek valleys (Figure 2-16).

Figure 2-16. Model Domain for Numerical Simulation of Tritium Transport in the Uppermost Aquifer.



The modeled area was subdivided into 27 pieces. Each piece was assigned a set of values for hydraulic properties based on current hydrogeologic knowledge. The ground-water flow portion of the model was then calibrated using water table maps for 1944 and 1979 that showed, respectively, elevations of the water table before and after disturbance by Hanford operations. Hydraulic conductivities and boundary fluxes for Dry Creek and Cold Creek were adjusted in the model until water table elevation contours produced by the simulations closely approximated those of the 1944 and 1979 maps.

To help reduce numerical oscillation and dispersion, the downgradient portion of the numerical grid was refined by relatively small-scale discretization. The resulting grid for the overall model domain contained 4,639 elements and 4,773 nodes. Each square element in the north (downgradient) part of the model domain had sides 333 m (1,092 ft) long. Numerical effects near the disposal facility resulted in a simulated acceleration of solute transport near the facility, resulting in a prediction of decreased travel time and increased tritium concentration at the river.

2.4.3.2 Input Parameters. For purposes of simulating advective flow through the aquifer, a continuous effluent flux rate of 568 L/min (150 gal/min) was assigned to the disposal site in the calibrated model. Subsequent to the analysis, estimates of the average annualized discharge rate increased by 83 L/min (22 gal/min). The planar area of the aquifer through which this influx was simulated was estimated by accounting for the effects of lateral spreading of the treated effluent in the vadose zone above the water table. This estimation assumed isotropic conditions for horizontal hydraulic conductivity and resulted in an estimated area of 8,350 m^2 (90,000 ft^2) through which treated effluent entered the top of the uppermost aquifer.

Because the model was two-dimensional and oriented in a horizontal plane, it did not account for vertical gradients within the aquifer. Downgradient of the ETF disposal facility, the effect on the regional hydraulic gradients of past and current discharges of treated effluent to the 216-B-3 Pond complex (see Figure 2-16) was addressed by assuming a flux of 62.5 million L/d (16.4 million gal/d) at that location. The flux was assumed to be distributed uniformly at the edges of a square element. Each edge of the element representing the 216-B-3 Pond complex was 998 m (3,275 ft) long.

In addition to hydraulic head distributions generated by the ground-water flow model, simulation of tritium movement through the aquifer required input for dispersivities, retardation factors, decay rates, source concentrations, and effective porosities. Values for longitudinal and transverse dispersivities were obtained from a combination of Hanford Site data and data from similar alluvial and glaciofluvial sediments elsewhere.

Because dispersivity is a scale-dependent parameter, the dispersivities chosen for model input were selected to conservatively underestimate the size of the tritium plume and thereby overestimate the concentration of tritium where it is predicted to intercept the Columbia River. A longitudinal dispersivity of ~36.5 m (120 ft) and a transverse dispersivity of ~12.2 m (40 ft) were used (Golder Associates 1991).

Tritium was assumed to decay in accordance with its half-life of 12.3 yr (corresponding to a first-order decay rate of 0.056 yr^{-1}). Based on its known behavior, tritium was assumed to move inseparably with the ground water in the uppermost aquifer. Consequently, a retardation factor of 1.0 was used. The modeled volumetric flux of treated effluent entering the aquifer was 568 L/min (150 gal/min). The concentration of tritium in treated effluent entering the aquifer was assumed for purposes of the analysis to be 21 μCi/L, distributed evenly over model elements representing the area over which the effluent was assumed to enter the aquifer. Subsequent to the analysis, the expected concentration of tritium in the discharged effluent was revised substantially downward to 6.3E+06 pCi/L. Effective porosity values were assumed to be correlated with hydraulic conductivity and were estimated to range from 0.15 to 0.25 (Golder Associates 1991).

2.4.3.3 Interpretation of Two-Dimensional Solute Concentrations. Because the two-dimensional nature of the model portrayed the treated effluent as being instantaneously mixed throughout the entire modeled aquifer thickness of ~30 m (100 ft), the model depicted tritium concentrations in the aquifer as being proportional to the aquifer thickness. To compensate for this distortion, the simulated concentration was scaled by a factor which reflected the likelihood that the treated effluent will not mix vertically throughout the aquifer thickness. Golder Associates (1991) assumed an arbitrary 6 m (20 ft) mixing depth, corresponding to the typical screened interval for Hanford Site monitoring wells in the uppermost aquifer.

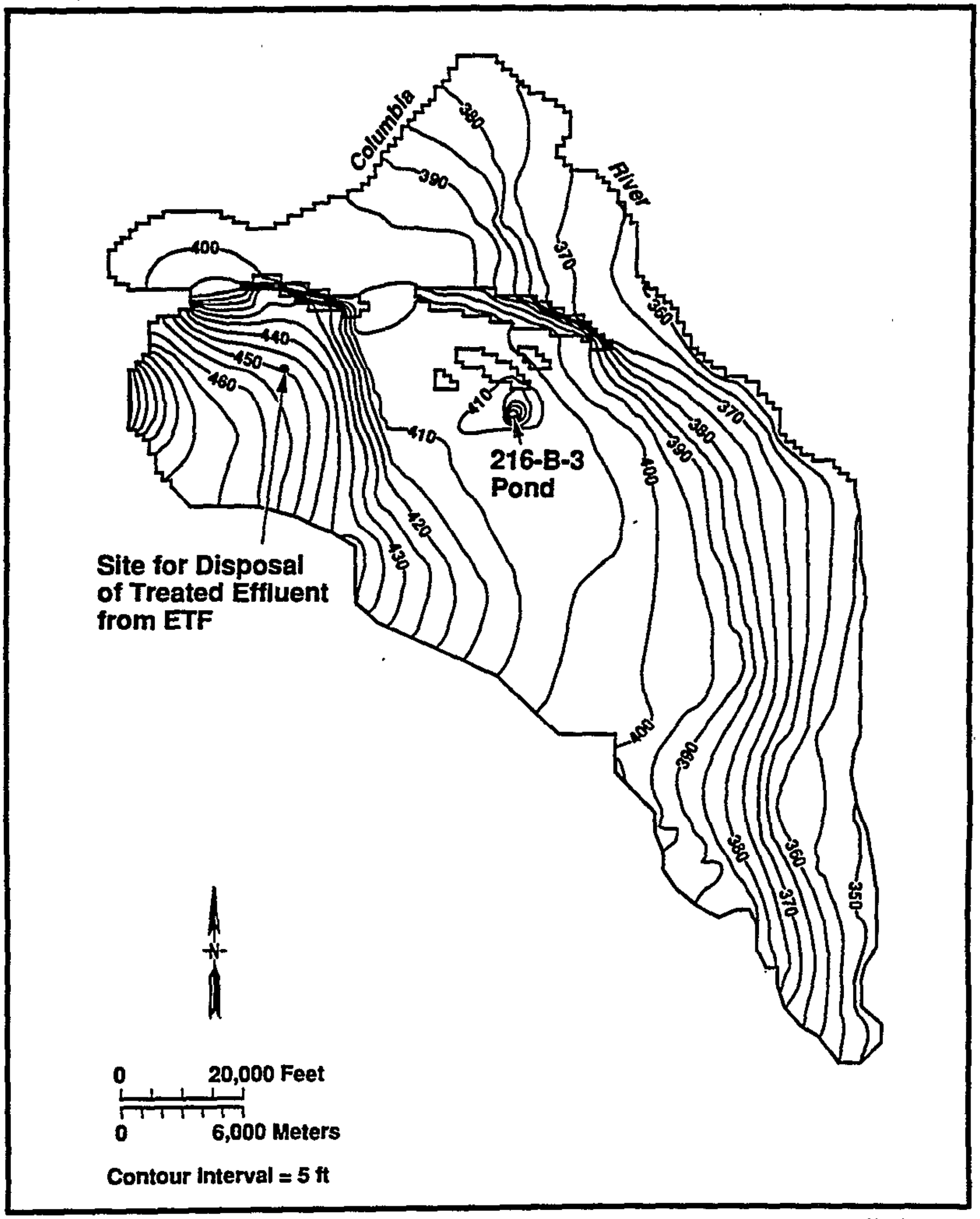
2.4.3.4 Results. Contours of simulated steady-state hydraulic head after operation of the disposal facility are shown in Figure 2-17. The results indicate that disposal of treated effluent at the projected rate will have relatively little effect on the local direction of ground-water movement. Ground-water flow directions will remain essentially unchanged ~300 m (1,000 ft) from the disposal site (i.e., within 20° of the northeasterly regional flow direction). Reversal of the regional hydraulic gradient will extend only ~150 m (500 ft) to the southwest of the facility. However, because monitoring well 699-48-77A is only 90 m (300 ft) upgradient from the disposal facility (Figure 2-4), a well further south or southwest may be selected to monitor upgradient conditions after discharges to the facility begin (see Section 3.3 and Figure 3-4).

Tritium transport simulations were run until steady-state conditions were achieved. A travel time from the disposal site to the Columbia River of at least 100 yr was indicated by the simulation results. Consequently, tritium's residence period in the uppermost aquifer would reduce its concentration at the Columbia River to less than 1/300 the level at the disposal site because of radioactive decay.

Because dispersivity values appropriate for the distance from the disposal facility to the Columbia River were used throughout the model domain, tritium isoconcentration contours closer than several thousand feet from the facility are considered to have high uncertainty. Contours of simulated concentration were plotted for several intervals between the time of facility startup and the reestablishment of steady-state conditions ~205 yr later. These results are shown in Figures 2-18 through 2-22. As can be seen by comparing the figures, near steady-state conditions occur after 105 yr. Simulation results suggest that treated effluent initially migrates relatively slowly in the uppermost aquifer because of the comparatively low hydraulic conductivity of Ringold unit E in the vicinity of the disposal site, and accelerates as it passes through the Hanford formation gravels in the gap between Gable Mountain and Gable Butte.

Figures 2-23 through 2-26 show profiles of simulated tritium concentration in ground water entering the Columbia River at the locations shown in Figure 2-27. The concentrations simulated at any given location along the river are subject to large uncertainties because a small change in direction of tritium migration, due to high-permeability channels (USGS 1987), could have large effects on concentrations at the edge of the treated effluent plume. However, the estimated maximum concentrations of tritium entering the river at the times shown are judged by Golder Associates (1991) to be considerably more accurate than the simulated concentrations at the edge of the plume.

Figure 2-17. Simulated Hydraulic Head Contours for Steady-State Condition After Startup of Facility Operation.



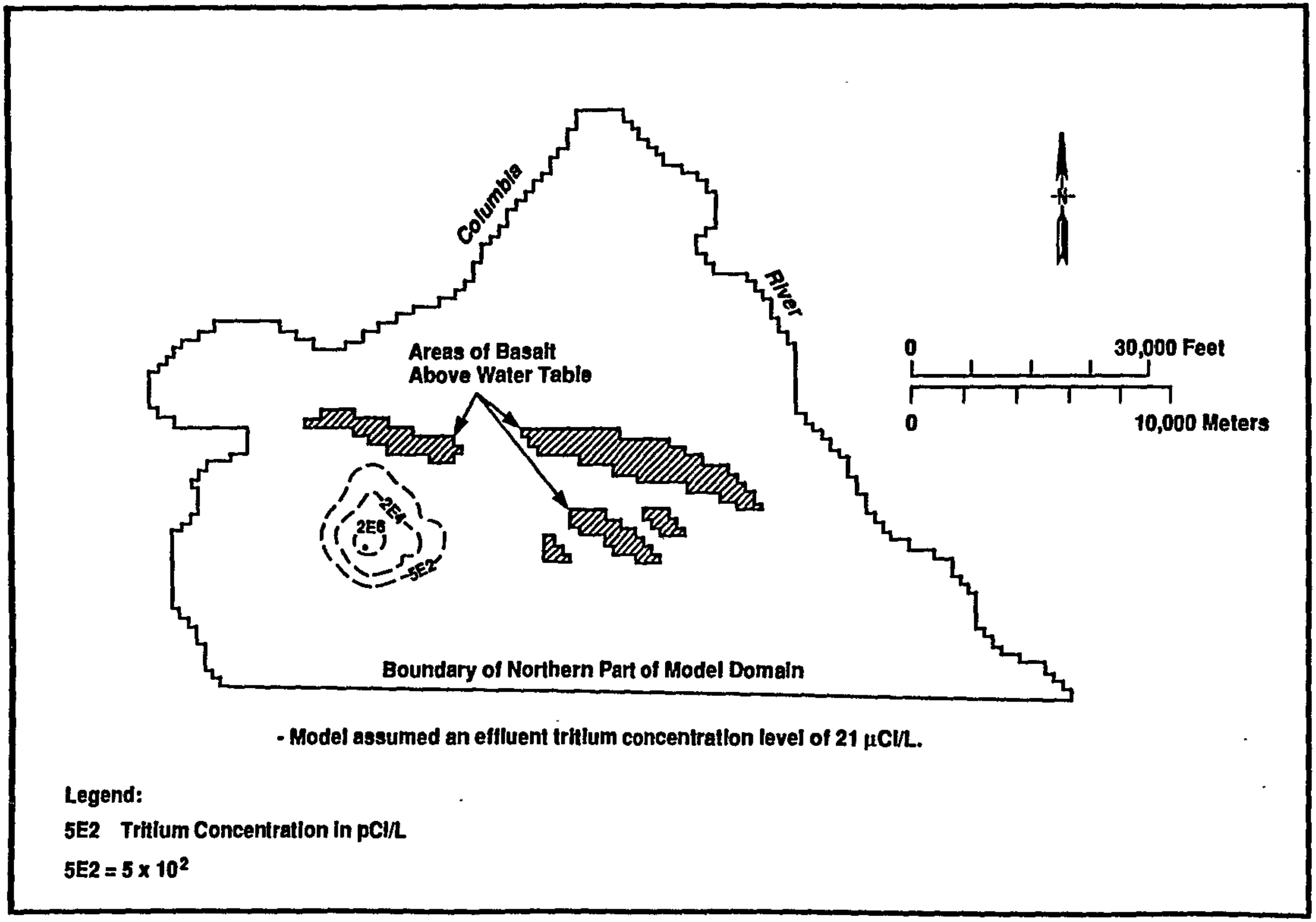


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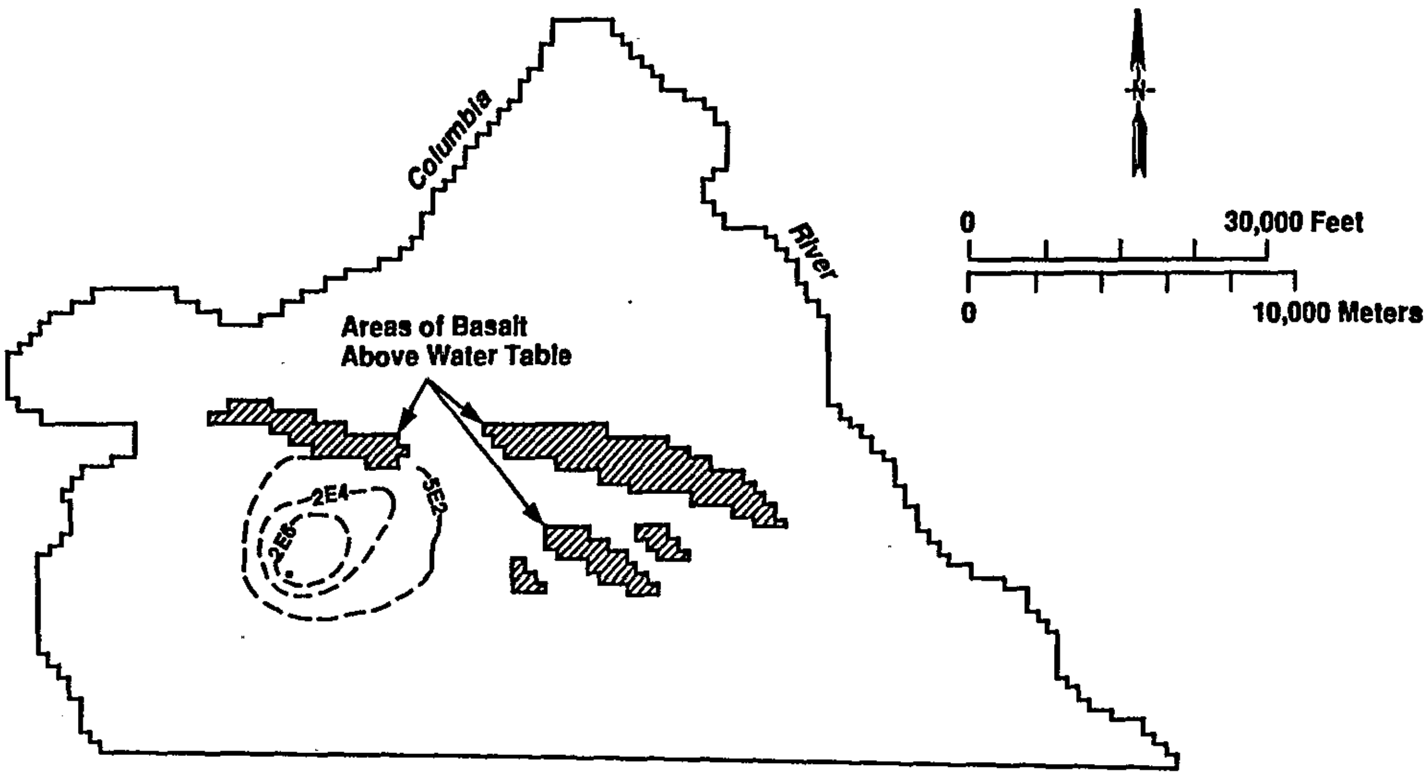
Figure 2-18. Simulated Tritium Concentrations After 5 Years.



- Model assumed an effluent tritium concentration level of 21 µCi/L.

Legend:

5E2 Tritium Concentration in pCi/L

5E2 = 5 x 10^2

H9503006.13

Figure 2-19. Simulated Tritium Concentrations After 55 Years.

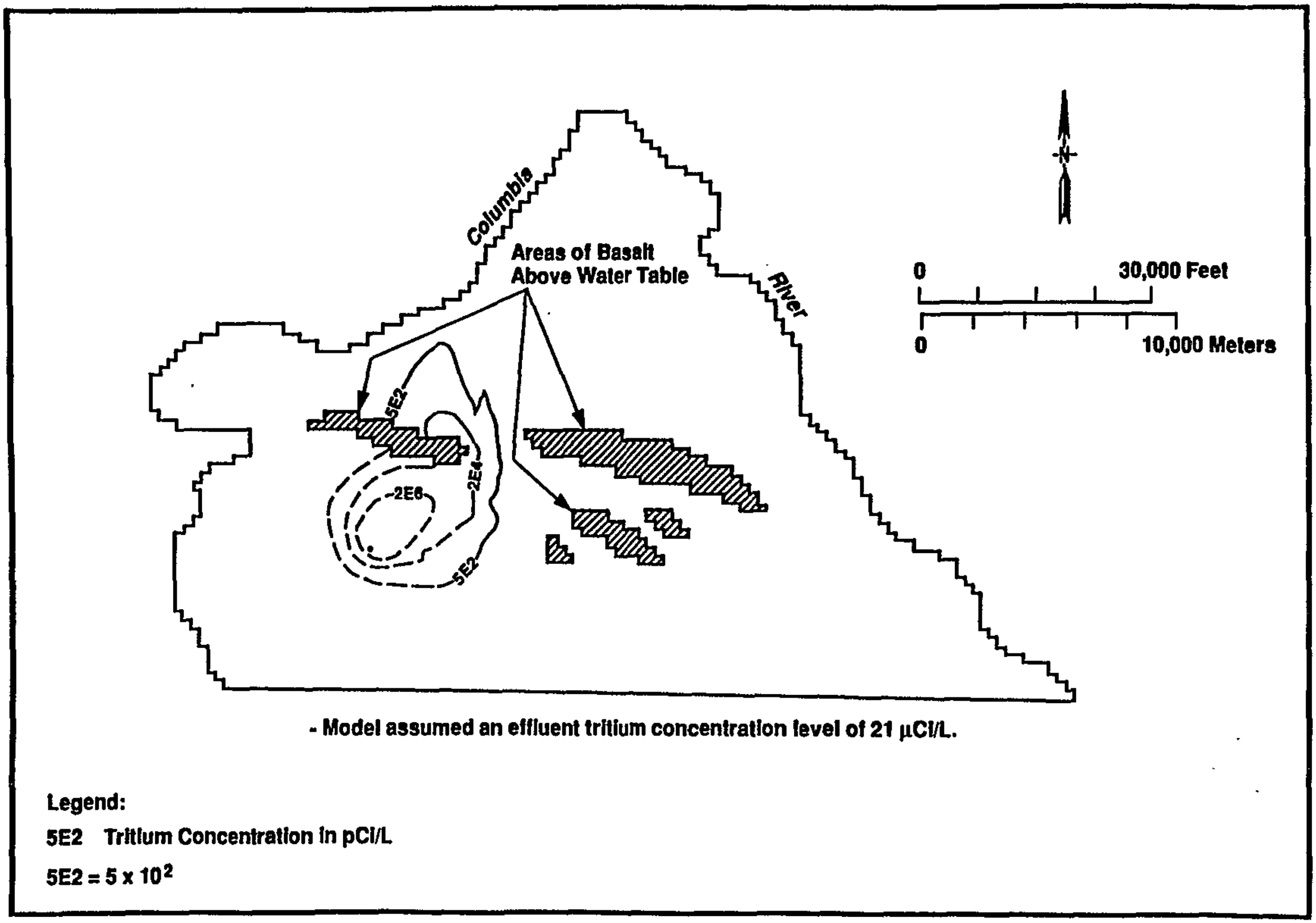


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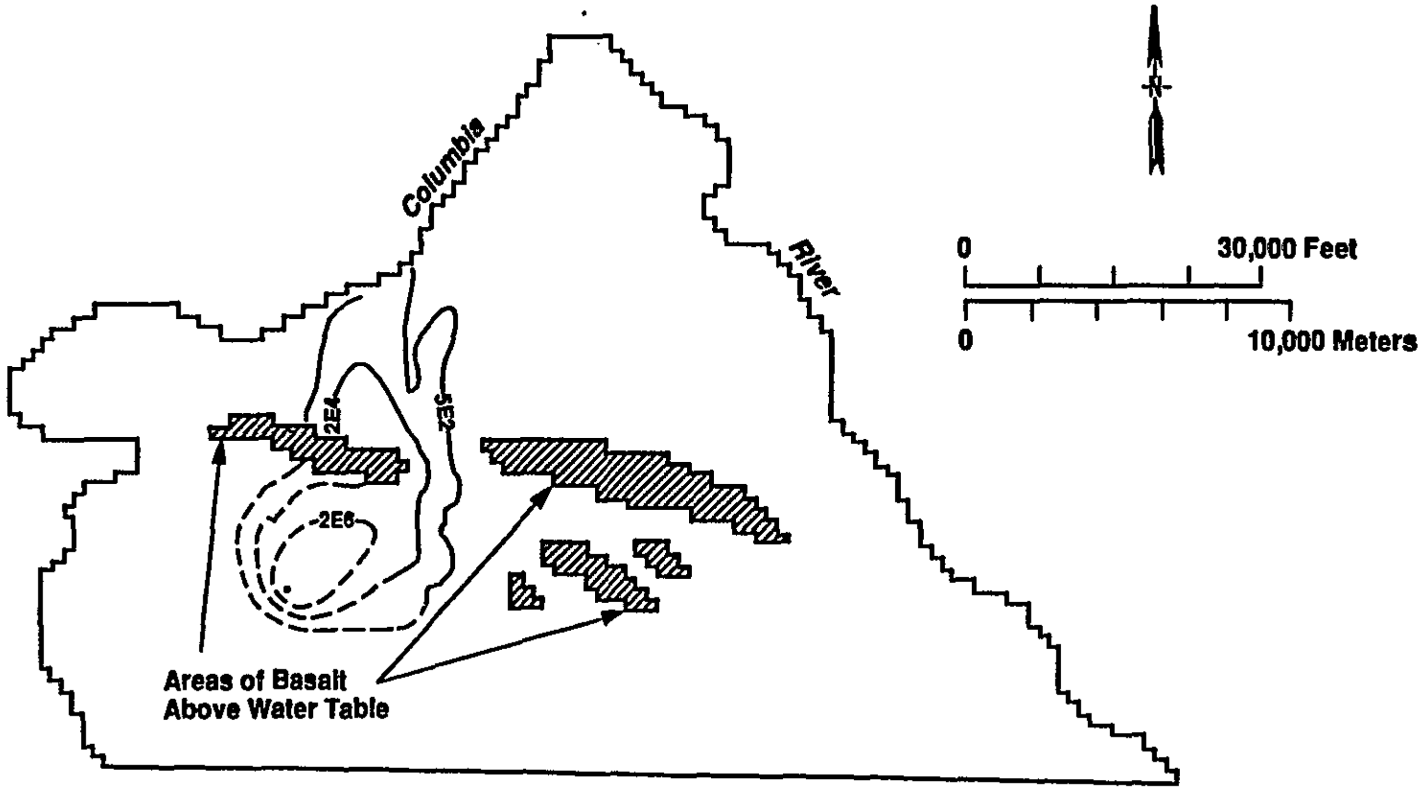
Figure 2-20. Simulated Tritium Concentrations After 85 Years.



- Model assumed an effluent tritium concentration level of 21 µCi/L.

Legend:

5E2 Tritium Concentration in pCi/L

5E2 = 5 x 10^2

H9503008.15

Figure 2-21. Simulated Tritium Concentrations After 150 Years.

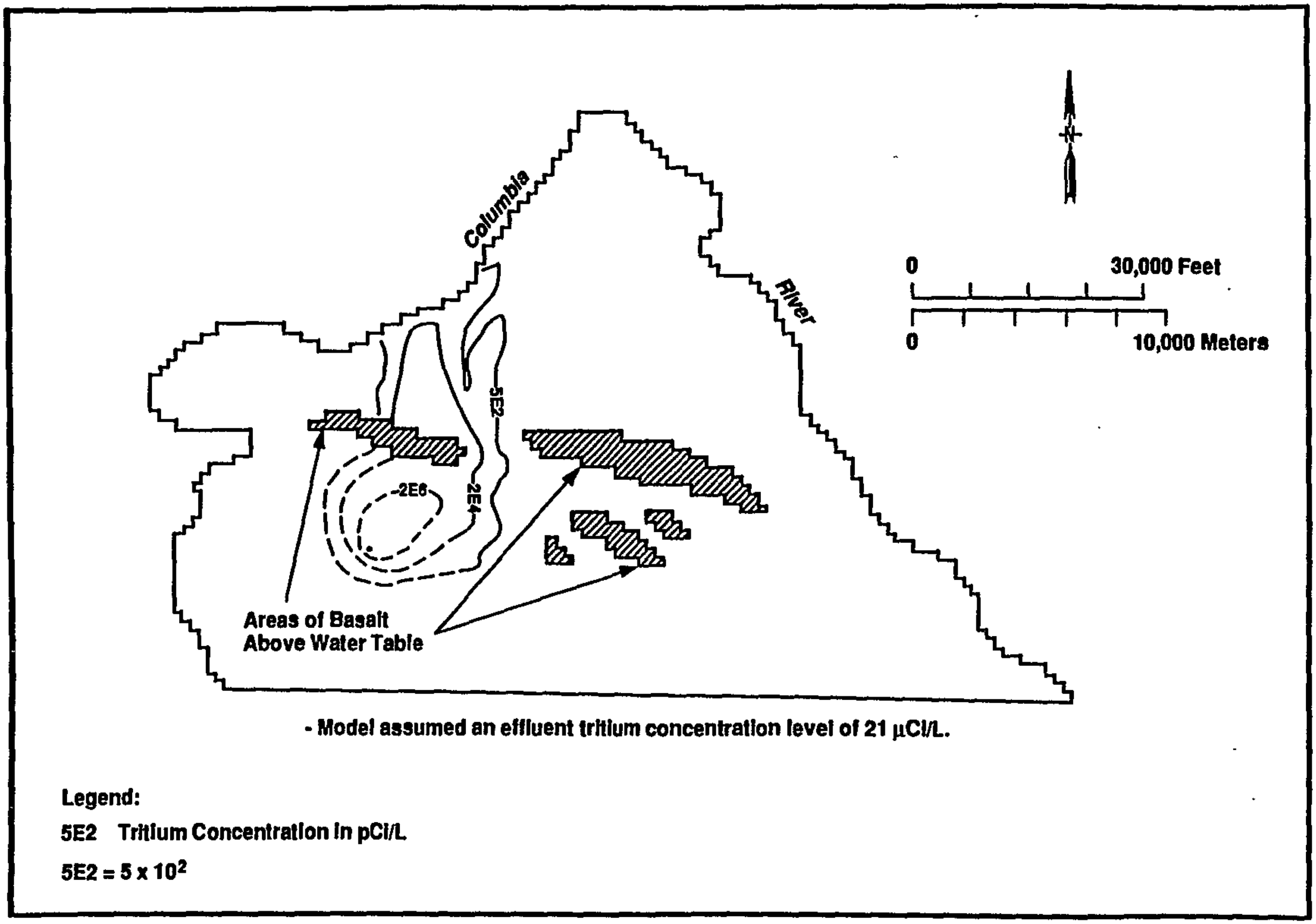


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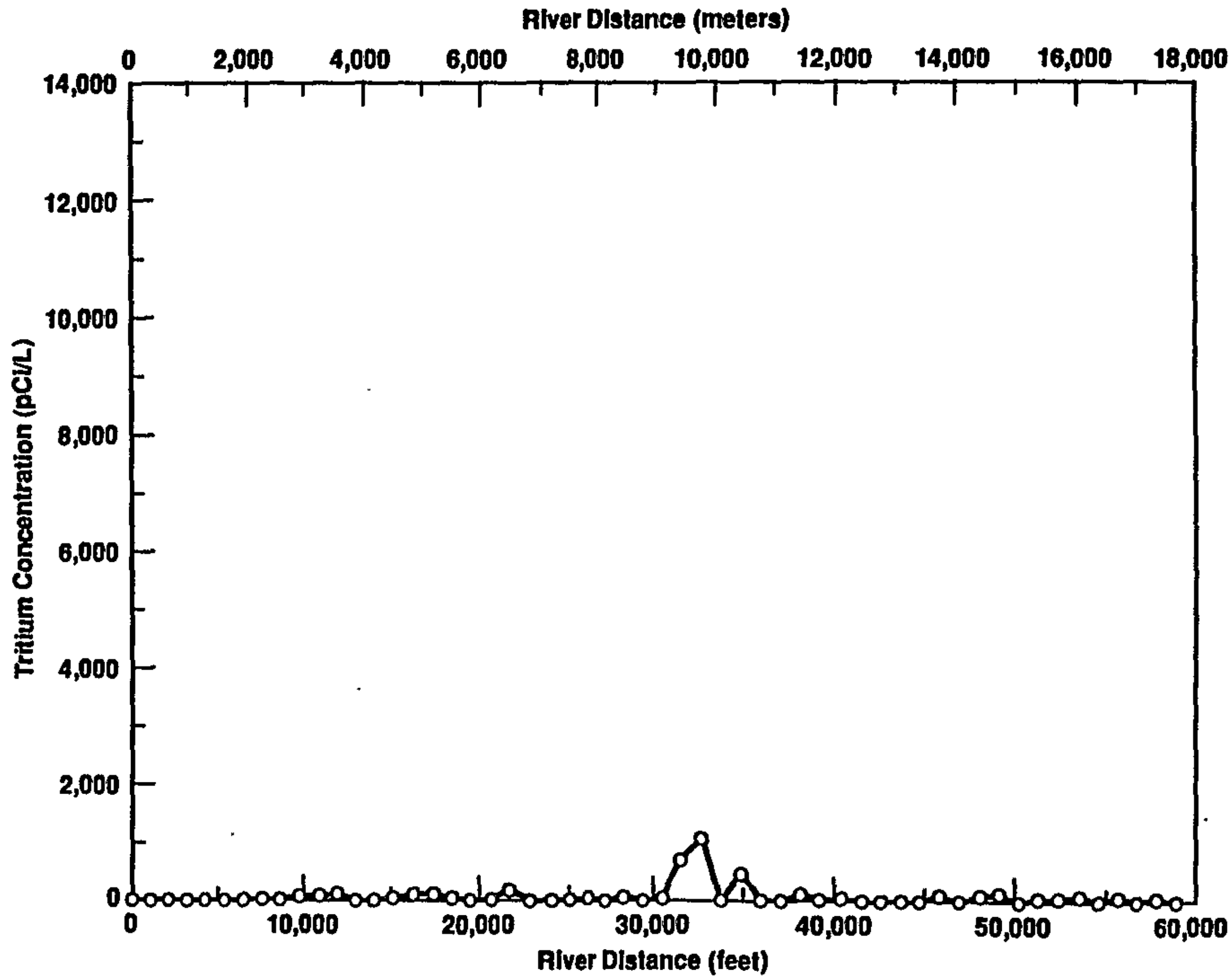
Figure 2-22. Simulated Tritium Concentrations After 205 Years.



See Map of River Distances on Figure 2-27.

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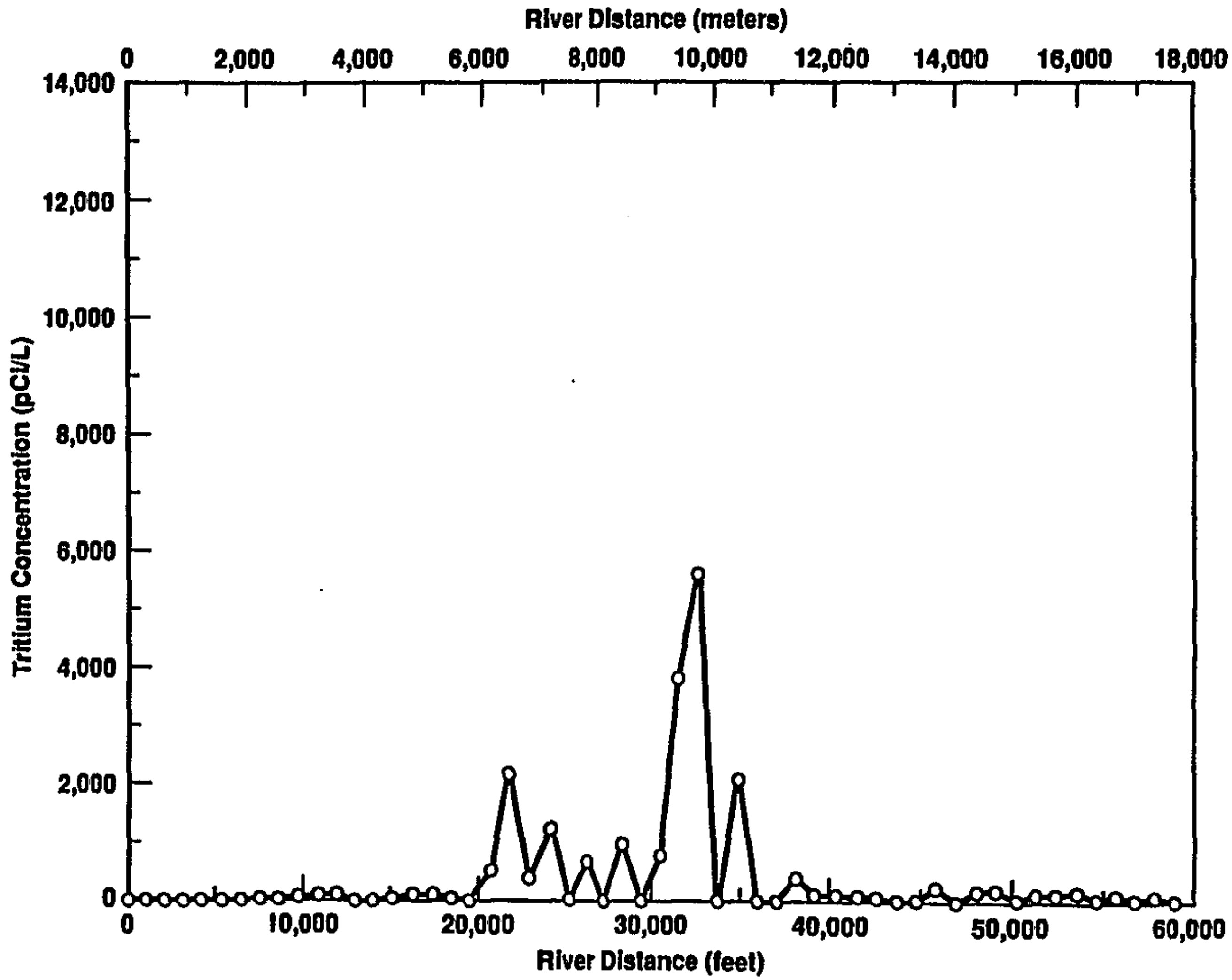
Figure 2-23. Simulated Profile of Tritium Concentration in Ground Water Entering the Columbia River After 105 Years.



See Map of River Distances on Figure 2-27.

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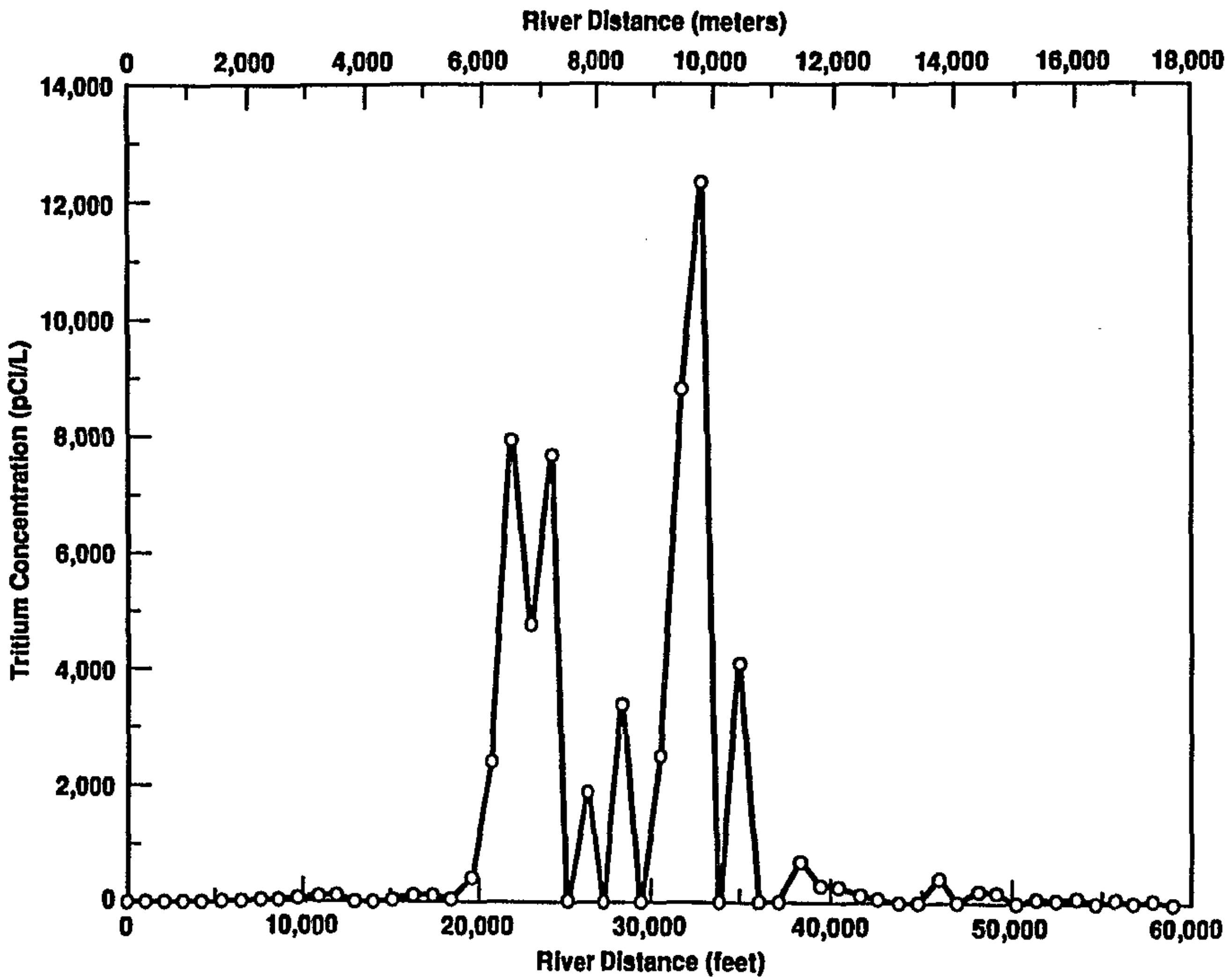
Figure 2-24. Simulated Profile of Tritium Concentration in Ground Water Entering the Columbia River After 125 Years.



See Map of River Distances on Figure 2-27.

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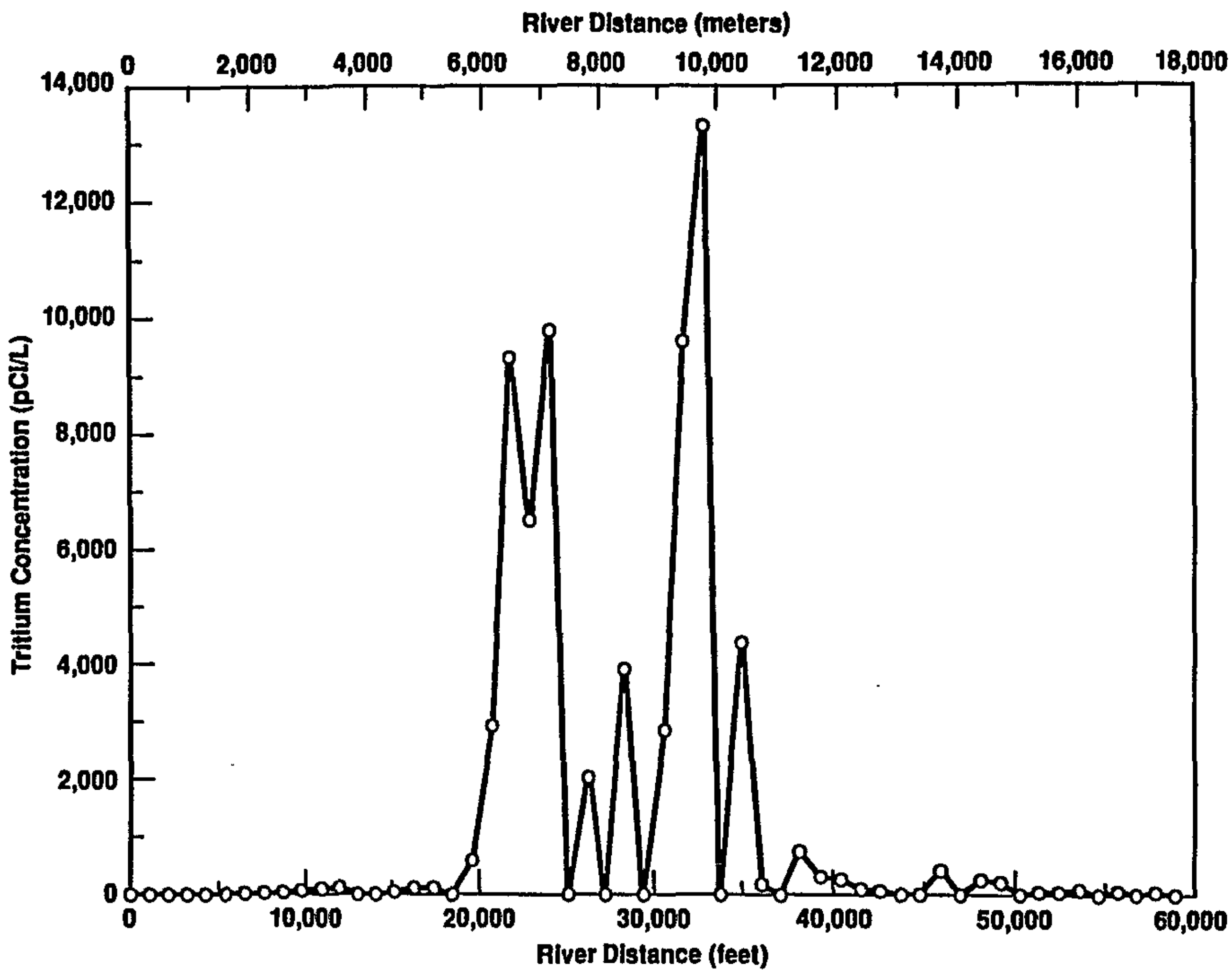
Figure 2-25. Simulated Profile of Tritium Concentration in Ground Water Entering the Columbia River After 165 Years.



See Map of River Distances on Figure 2-27.

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Figure 2-26. Simulated Profile of Tritium Concentration in Ground Water Entering the Columbia River After 205 Years.

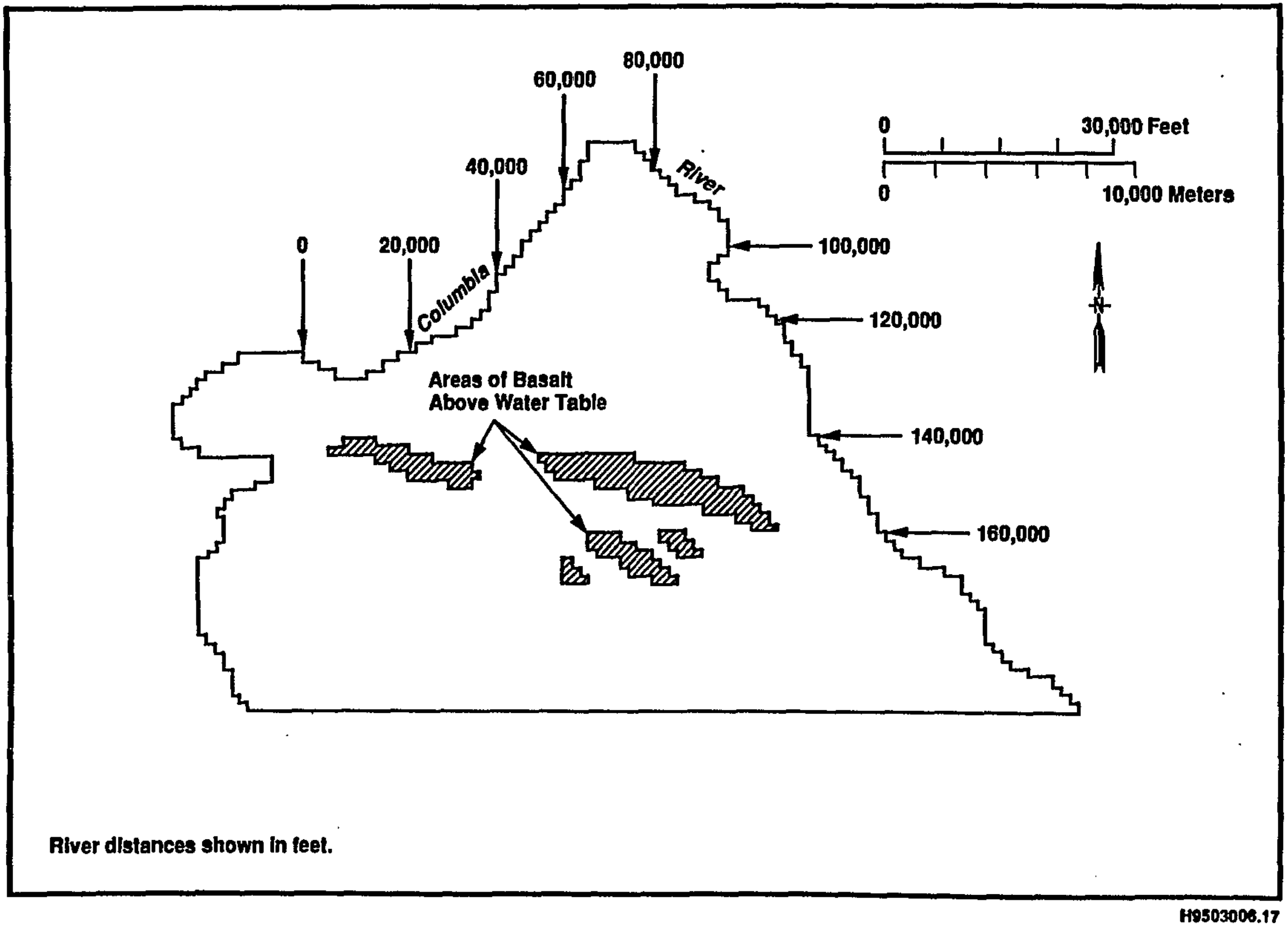

Figure 2-27. River Distances Used in Tritium Discharge Concentration Profiles.

Profiles are shown for simulated tritium concentrations at 105, 125, 165, and 205 yr after initiation of facility operation. For steady-state conditions (205 yr), maximum tritium concentrations at the riverbank resulting from facility operations are predicted to be 0.14 μCi/L (14,000 pCi/L). This value is below the federal criterion of 0.2 μCi/L (20,000 pCi/L). Mixing and dilution in river water are expected to reduce tritium levels to a small fraction of the drinking water criterion within a short distance downstream of the riverbank discharge area.

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3.0 GROUND-WATER MONITORING PLAN

This chapter describes how the effects of disposal facility operation on ground water will be assessed and identified, and identifies documentation that will be provided to demonstrate that operation of the facility complies with ground-water quality standards and operating permit conditions.

3.1 MONITORING OBJECTIVES AND SCOPE

The objectives and scope of ground-water monitoring for the discharge facility derive from operating permit requirements, the geology and hydrology of the site, and discharge composition and volume.

The principal ground-water quality regulations applicable to the discharge composition (WAC 173-200) emphasize the nondegradation of current ground-water quality. The regulations require "establishment of an enforcement limit as near the natural ground-water quality as practical," and establishment of the point of compliance in ground water "...as near the source as technically, hydrogeologically, and geographically feasible." State Waste Discharge Permit ST-4500 is the means by which the enforcement limit is established.

3.2 MEDIA TO BE MONITORED

Wastewater discharged to the disposal site will be sampled and analyzed in accordance with provisions of State Waste Discharge Permit ST-4500. Monitoring will include "end-of-pipe" sampling at the ETF and LERF (WHC 1995), as well as continued ground-water monitoring associated with the disposal facility. Ground water will be sampled and analyzed in accordance with Permit ST-4500 provisions, as described in Sections 3.4, 3.5, 3.6, and 3.7.

3.3 MONITORING WELL NETWORK DESIGN

Two boreholes were initially drilled at the disposal site for hydrogeologic characterization and/or monitoring. Borehole 699-48-77A was drilled upgradient from the site and was completed as a RCRA-compliant ground-water monitoring well. Borehole 699-48-77B was abandoned at a depth of 18 m (~60 ft) when it began to substantially deviate from vertical and decommissioned (see Figure 2-4).

Based on data from these boreholes and results from computer modeling (Golder Associates 1992) of the effluent-capture efficiencies of alternative locations for downgradient monitoring, wells 699-48-77C and 699-48-77D were drilled at the locations shown in Figure 2-4. Like well 699-48-77A, well 699-48-77D was completed in the Ringold unit E fluvial gravel to monitor ground water in the upper portion of the uppermost aquifer. Well 699-48-77C was completed deeper in the aquifer (see Figure 2-10). Well 699-48-77A is ~91 m (300 ft) from the south edge of the disposal facility, well 699-48-77C is ~13 m (40 ft) from the east edge, and well 699-48-77D is ~5 m (16 ft) from the north edge (see Figure 2-4).

The selection of locations and screened intervals of the two downgradient wells were based on the need to (1) monitor the upper part of the uppermost aquifer as near as practical downgradient from the disposal site, (2) maximize the monitoring life of the wells, based on the predicted change in direction and elevation of ground-water flow resulting from the cessation of discharges to U Pond in the 200 West Area, and (3) maximize the efficiency of the monitoring wells in intercepting treated effluent.

The third need was met by using a monitoring-efficiency model (Golder Associates 1992) to predict where treated effluent discharged to the facility would most likely be detected by two downgradient monitoring wells, given a range of potential downgradient flow directions. The predictions were evaluated in terms of which locations most closely approached 100% efficiency in monitoring the simulated area of the treated effluent plume. Modeling results for the likely range of potential downgradient flow directions are summarized in Table 3-1. Based on the efficiencies shown in the table, the two downgradient wells (699-48-77C and 699-48-77D) were located as shown in Figure 2-4.

Table 3-1. Modeling Results for Downgradient Monitoring Well Efficiencies.

Direction of hydraulic gradient	Predicted ground-water monitoring efficiency (%)
N 20° E	99.2
N 30° E	98.8
N 40° E	98.7
N 50° E	97.5

The upgradient well (699-48-77A) will continue to be used for future background water-quality monitoring. Continued use of this well to monitor background water quality for the disposal facility is justified based on its RCRA-compliant construction and results from the monitoring efficiency model (Figure 3-1). In this instance, the model was used to locate the facility downgradient of well 699-48-77A such that the well would have a 99% probability of detecting any change in the quality of water upgradient prior to startup of the facility, for a ground-water flow direction of N 30°E (Figure 3-1).

As described in Sections 2.4.2.3 and 2.4.3.4, model predictions indicate that a reversal of hydraulic gradient will occur at upgradient well 699-48-77A during facility operation. When this reversal occurs another well, south to southwest of the facility, will be chosen as a new upgradient well.

3.4 CONSTITUENTS TO BE SAMPLED

Future analyses of ground water from the three monitoring wells will be used to determine if ground-water quality has changed from the baseline pre-operations condition. The constituents to be monitored are based on residual constituents potentially contained in the discharge. These constituents are discussed in the sections that follow in the context of the baseline ground-water monitoring results discussed in Section 2.3.4. Constituents to be monitored, the respective analytical methods, and their highest allowable concentrations are listed in Table 3-2.

Figure 3-1. Optimization Modeling for Upgradient Well.
(from Reidel 1993)

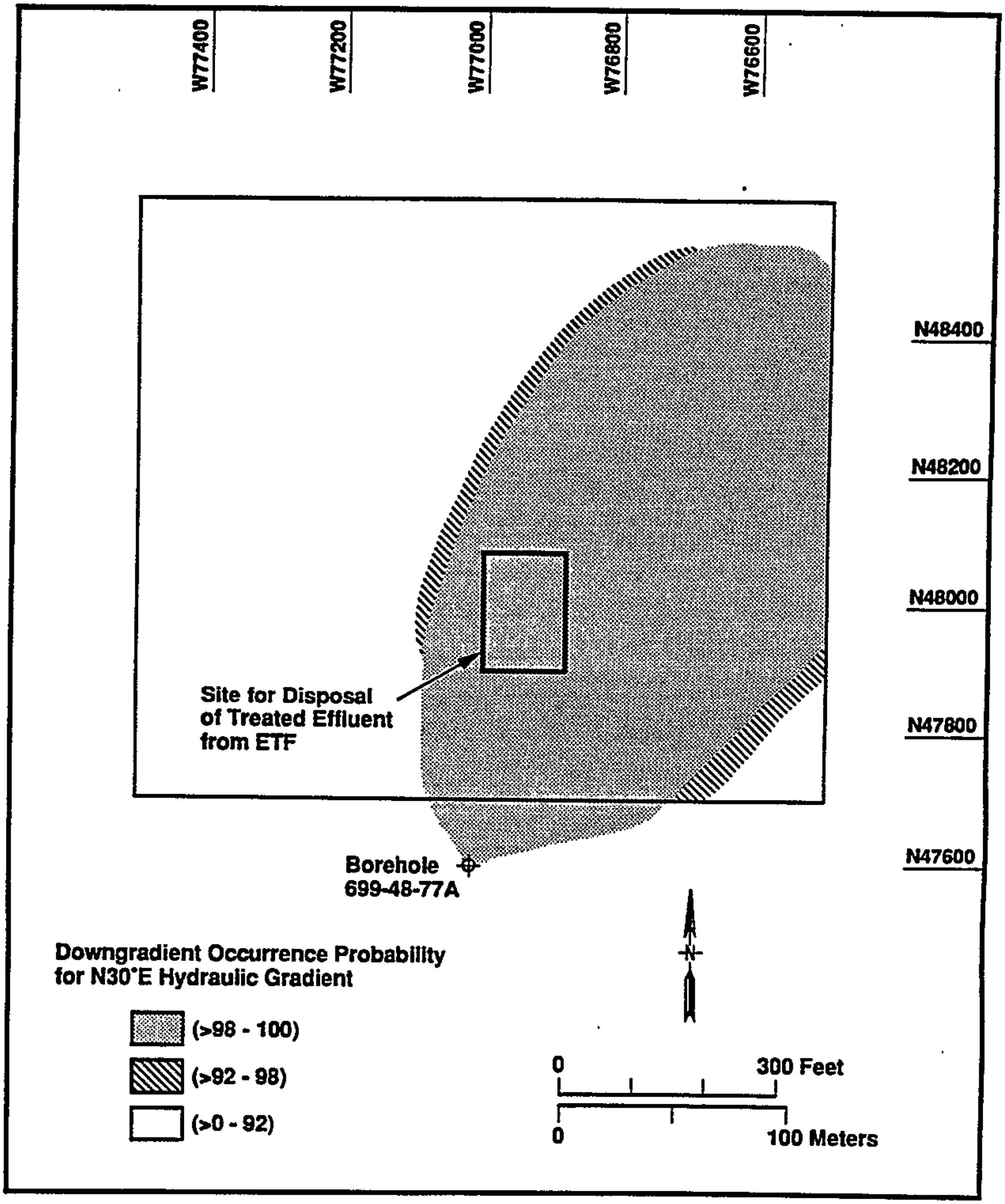


Table 3-2. Analytes to be Monitored in the Disposal Facility Wells.
(from Washington State Waste Discharge Permit ST-4500, 1995)

Constituent or characteristic	Analytical method	Highest allowable concentration (PPB) unless noted otherwise[a]
acetone	SW-846, 8240/8260	160[b]
ammonia	40 CFR 136, 350.1/2/3	1,000[b]
benzene	SW-846, 8240/8260	5
cadmium, total	SW-846, 7131A	10
chloroform	SW-846, 8240/8260	6.2[b]
copper, total	SW-846, 6010	70[b]
lead, total	SW-846, 7421	50
mercury, total	SW-846, 7470/7471	2
pH, in pH units	SW-846, 9040A/EPA 150.1	6.5 to 8.5
sulfate	EPA 300.0	30,000[b]
tetrahydrofuran	SW-846, 8240/8260	100[b]
total dissolved solids	40 CFR 136, 160.1	500,000
gross alpha	lab specific	(pCi/L) monitor only[c]
gross beta	lab specific	(pCi/L) monitor only[c]
strontium-90	lab specific	(pCi/L) monitor only[c]
tritium	lab specific	(pCi/L) monitor only[c]

Note: Enforcement limits shall be met in ground waters collected from monitoring well numbers 699-48-77C and 699-48-77D.

[a] Defined as the average of all measurements from a well during a quarterly reporting period. The four quarters are defined as January through March, April through June, July through September, and October through December. At least one (1) sample will be analyzed and reported for each of the above constituents during each quarter.

[b] Noncompliance with permit limits, up to the water-quality-based limit per Chapter 173-200 WAC, is not subject to penalty but is subject to the requirements of Special Condition No. 4 of Permit ST-4500.

[c] Constituents which require "monitoring only" have not been assigned permit limits or early warning values, but must be sampled, analyzed, and reported by the Permittee pursuant to the permit.

3.4.1 Turbidity and Other Field Analysis Parameters

Turbidity will be measured in the field to ensure consistent sample quality (see Section 2.3.4.1). Quadruplicate measurements of pH, SC, temperature, alkalinity, and turbidity will be made. Temperature, alkalinity, and turbidity will be measured prior to ground water sample collection. These measurements will aid in determining if ground-water quality is changing from the baseline, pre-operations condition.

3.4.2 Cations and Anions

Total cation milliequivalents (calcium, magnesium, potassium, and sodium), total anion milliequivalents (nitrate, sulfate, chloride, and alkalinity), SC, and TDS will be evaluated by means of the equations noted in Section 2.3.4.2. The results of the evaluation of anion and cation analyses will be used to confirm the results of SC measurements. The differences between water quality in the upgradient well (699-48-77A) and the two downgradient wells (699-48-77C and 699-48-77D), as well as differences in each monitoring well for various sampling dates, will be evaluated based on results of the cationic and anionic analyses.

3.4.3 Metals

Dissolved metals will be analyzed in ground water samples from each well. The metals to be monitored are listed in Table 3-2. Both filtered and unfiltered samples will be analyzed for metals for two reasons. First, the baseline water-quality data reported in Section 2.3.4 show considerable sensitivity to well construction or sampling variability when comparisons are made between filtered and unfiltered samples. Analyses of both types of samples will continue to aid in identifying these sensitivities. Second, strict criteria for consistency in the maximum allowable purging and sampling rates will be imposed to ensure that the sampling rate is commensurate with the pumping rate used during well development (see Section 2.3.4.1). Analytical data for metals to be monitored in samples of ground water collected during facility operation will be compared with pre-operation data to evaluate changes, if any, in ground-water quality.

3.4.4 Organic Compounds

Analyses will be made both for gross indicators of organic compounds and specific organic compounds. Samples for TOX and TOC will be collected and analyzed in quadruplicate because of the large known variability in analytical results for TOX and TOC. These data will be compared with the baseline data to assess changes, if any, in ground-water quality. Specific organic compounds that will be monitored are listed in Table 3-2.

3.4.5 Radionuclides

Radionuclides have been identified as potential residual constituents of wastewater discharged to the facility. Analyses will be made for gross indicators and specific isotopes (listed in Table 3-2). These data will be compared with the baseline data to assess changes, if any, in ground-water quality.

3.5 STATISTICAL EVALUATION OF GROUND-WATER MONITORING DATA

This section describes how ground-water quality data from operational monitoring will be statistically evaluated. Statistical methods used to derive ground-water quality baseline values for the potential constituents of concern using pre-operational monitoring data were discussed in Section 2.3.5.

The objectives of collecting and evaluating the ground-water monitoring data are as follows:

- Determine if ground-water quality has changed from the baseline, pre-operational conditions
- Evaluate the impact, if any, that the facility operations have on the quality of ground water in the uppermost aquifer
- Demonstrate compliance with the ground-water enforcement limits set forth in Permit ST-4500 (i.e., Special Condition S1.A).

3.5.1 Changes From Pre-Operational Conditions

Ground water samples will be collected quarterly from wells 699-48-77A, 699-48-77C, and 699-48-77D, and analyzed for the permit constituents listed in Table 3-2. Background values were established prior to disposal facility startup using pre-operational ground-water quality data from the three wells (see Appendix D.1). The background concentrations represent conditions present in the uppermost aquifer prior to the onset of discharges to the facility. Background values were defined to include at least 95% of the measurements with 95% confidence (see Section 2.3.5). To determine if ground-water quality baseline conditions have changed, intra-well comparisons based on tolerance limits will be made. If the concentration of a constituent in a well exceeds the baseline value for that well, the well will be resampled and the verification sample analyzed to statistically reduce the potential for false readings. This method is the best available approach to balance false positive and false negative decisions (Gibbons 1994).

3.5.2 Evaluation of Facility Effects on Ground-Water Quality

To evaluate the facility's impact on the quality of ground-water in the uppermost aquifer, a two-stage procedure as recommended by EPA (1992) is proposed. In the first stage, inter-well comparisons (i.e., upgradient/downgradient) will be made. Future samples from each compliance well (699-48-77C and 699-48-77D) will be compared, for each permit constituent listed in Table 3-2, against background values (i.e., tolerance limits derived for the upgradient well 699-48-77A). Each well that exceeds the tolerance limit will be resampled and only those permit constituents that exceed the limit will be retested via an upper prediction limit (i.e., stage-two). A prediction interval is designed to contain one or more future observations, whereas a tolerance interval is designed to contain a proportion of the population. The steps to calculate prediction intervals are given on pp. 5-24 to 5-28 of the Interim Final Guidance (EPA 1989). If the prediction limit is exceeded, for a particular permit constituent, verification resampling will be conducted and/or investigation of possible causes will be initiated. For example, historical data will be reviewed and a trend analysis will be performed to evaluate the likelihood of the change resulting from an upgradient source.

3.5.3 Compliance with Ground-Water Enforcement Limits

For each constituent or characteristic identified in Permit ST-4500 (Special Condition S1.A), at least one sample will be analyzed and the results reported for each of the three wells during each calendar quarter. Results from downgradient wells (699-48-77C and 699-48-77D) will be compared to the enforcement limits identified in the permit. Permit ST-4500, Special Condition S1.A (footnote 4) indicates that results exceeding permit enforcement limits for chloroform, copper (total), and sulfate will not violate the permit as long as these results do not exceed the water-quality standards identified in WAC 173-200 and Permit ST-4500. No enforcement limits for gross alpha, gross beta, strontium-90, and tritium are designated in Permit ST-4500, so comparisons are not possible for these constituents. Tritium concentrations will be evaluated using the tritium tracking network described in Section 3.7. As noted in Section 2.3.4.1 an average pH (field) of 8.1, with a range of 7.7 to 8.5, was reported for downgradient well 699-48-77D during six successive quarters of baseline data collection.

3.5.4 Reporting

Ground-water monitoring results will be summarized and reported on the Discharge Monitoring Report Form. If a constituent is detected in well 699-48-77C and/or 699-48-77D in a concentration that equals or exceeds the Early Warning Value, an Early Warning Report will be prepared to notify Ecology. This report will be written and submitted to Ecology within 10 calendar days from the date of detection of the Early Warning Value. At a minimum, the information in this report will include the following:

- Concentration of contaminant(s) that attained or exceeded the early warning value
- Concentrations of other contaminants monitored
- Location(s) and sampling date(s)
- Concentrations of other contaminants determined for previous sampling dates.

3.6 SAMPLING AND ANALYTICAL PROTOCOL

This section describes or references procedures for well purging, documentation of sample collection methods, chain-of-custody requirements, and laboratory analyses. Detailed descriptions of standard sampling and analysis procedures for specific analytes are provided by reference to the corresponding environmental investigations instructions (EII) (WHC 1988). Subcontractors will be contractually required to perform work according to preapproved standard operating procedures.

3.6.1 Well Purging

All sampling activities performed at the well sites will be recorded in the appropriate field logbook, as specified by EII 1.5, Field Log Books. Hydrostar pumps will continue to be used in existing monitoring wells for purging and sampling. Prior to sampling each well, the static water level will be measured and recorded as specified by EII 10.2, Measurement of Ground Water Levels. Based on the measured water level and well construction specifications, the volume of water in the well will be calculated and documented in the well sampling form and field notebook. As specified by EII 5.8, Ground-Water Sampling, each well will be purged prior to sampling until the approved criteria are met. Purgewater will be managed according to EII 10.3, Purgewater Management. For instances in which the well is pumped dry because of very slow recharge, the sample will be collected after recharge. Samples will be collected and preserved in the field as specified by EII 5.8, Ground-Water Sampling. Sampling personnel have the option not to decontaminate equipment if either single-use or dedicated sampling equipment is used.

The purge and sample collection pumping rates used at each of the three monitoring wells will be limited in accordance with the following criteria (see also Section 2.3.4). The monitoring wells were constructed to RCRA standards (WHC 1992) and were developed to a turbidity of <5 NTU. Hence, the pumping rate will be sufficiently slow and/or the pumping duration lengthened to achieve ≤ 5 NTU before samples are collected. To comply with this criterion, well 699-48-77A will be purged and samples collected at a pumping rate ≤ 5 L/min (≤ 1.5 gal/min), well 699-48-77C at ≤ 5 L/min (≤ 1.25 gal/min), and well 699-48-77D at ≤ 42 L/min (≤ 11.1 gal/min). These rates may be modified at the discretion of the scientist responsible for ground-water sampling at the facility.

3.6.2 Sample Collection

After the wells have been purged in accordance with the turbidity criteria described in Section 3.6.1, quadruplicate measurements of pH, SC, alkalinity, and temperature will be made to verify stability of the ground water during sampling. The four replicate measurements will allow statistical evaluation of these indicator parameters to be made for subsequent use in evaluating water quality. After sample bottles are filled, they will be placed in an insulated cooler containing ice for transport to the laboratory.

3.6.3 Sample Analysis

Table 3-2 identified constituents of concern monitored in ground water at the disposal facility. Corresponding analytical methods were selected from SW-846 (EPA 1992).

The analyses will be performed in a Washington State accredited laboratory. Laboratory quality assurance requirements will, at minimum, comply with the *Hanford Analytical Services Quality Assurance Plan* (DOE-RL 1994) and Stauffer (1995).

3.6.4 Quality Control

The QC program is based on Chapter One of SW-846, "Quality Control" (EPA 1992). Analytical samples are subject to in-process QC measures in both the field and laboratory.

QC samples prepared without the knowledge of the analytical laboratory are called "external" QC samples; QC samples prepared by the analytical laboratory and used to establish and continue the quality of the analytical laboratory are called "internal" QC samples. Two types of external QC samples will be collected and used to evaluate quality in the field and laboratory: (1) a field duplicate sample and (2) two different types of blank samples. One duplicate sample will be collected during each sampling event and will be analyzed for all of the constituents listed in Table 3-2. One transfer blank sample will be collected during each sampling event. Blank samples will be collected and analyzed only for volatile organic constituents.

The internal QC samples analyzed in the laboratory will consist of (1) matrix duplicate or matrix-spike duplicate samples, (2) laboratory control samples, (3) surrogate compound-spiked samples, (4) reagent-blank samples, and (5) calibration-check samples. These QC samples meet the minimum requirements, as applicable, for each analytical method specified in Table 3-2.

If the integrity of laboratory data is compromised, the analytical laboratory will notify the data user via nonconformance reports and/or records of decision.

3.7 TRITIUM TRACKING

Section S7.B of Permit ST-4500 requires the Permittee to identify wells that will comprise the network used to monitor the downgradient movement of treated effluent discharged to the ground water from the disposal facility, and to report the results from this monitoring network at least annually. The monitoring network will make use of the tritium present in the discharge as a tracer. The tracer will be used to track the rate and direction of movement of the treated effluent in the uppermost aquifer. Data from the monitoring network will be used to periodically recalibrate the numerical models, as described in Section 3.8. In turn, predictions by the numerical models, in conjunction with well-monitoring data, will be used to periodically reassess the needs for inclusion of specific wells in the tritium tracking network, as described in Section 3.7.3. This section describes the current monitoring of tritium in ground water near the facility and identifies the wells that initially will be used to monitor the effects of facility operation, and relates the process that will be used to periodically reassess the adequacy of the monitoring well network.

3.7.1 Current Tritium Monitoring in the Vicinity of the Disposal Facility

Numerous wells in the immediate vicinity of the disposal facility are currently monitored for tritium. This monitoring occurs in conjunction with RCRA ground-water monitoring by WHC for the LLWBG, and for the sitewide Ground-Water Surveillance Project conducted by PNL.

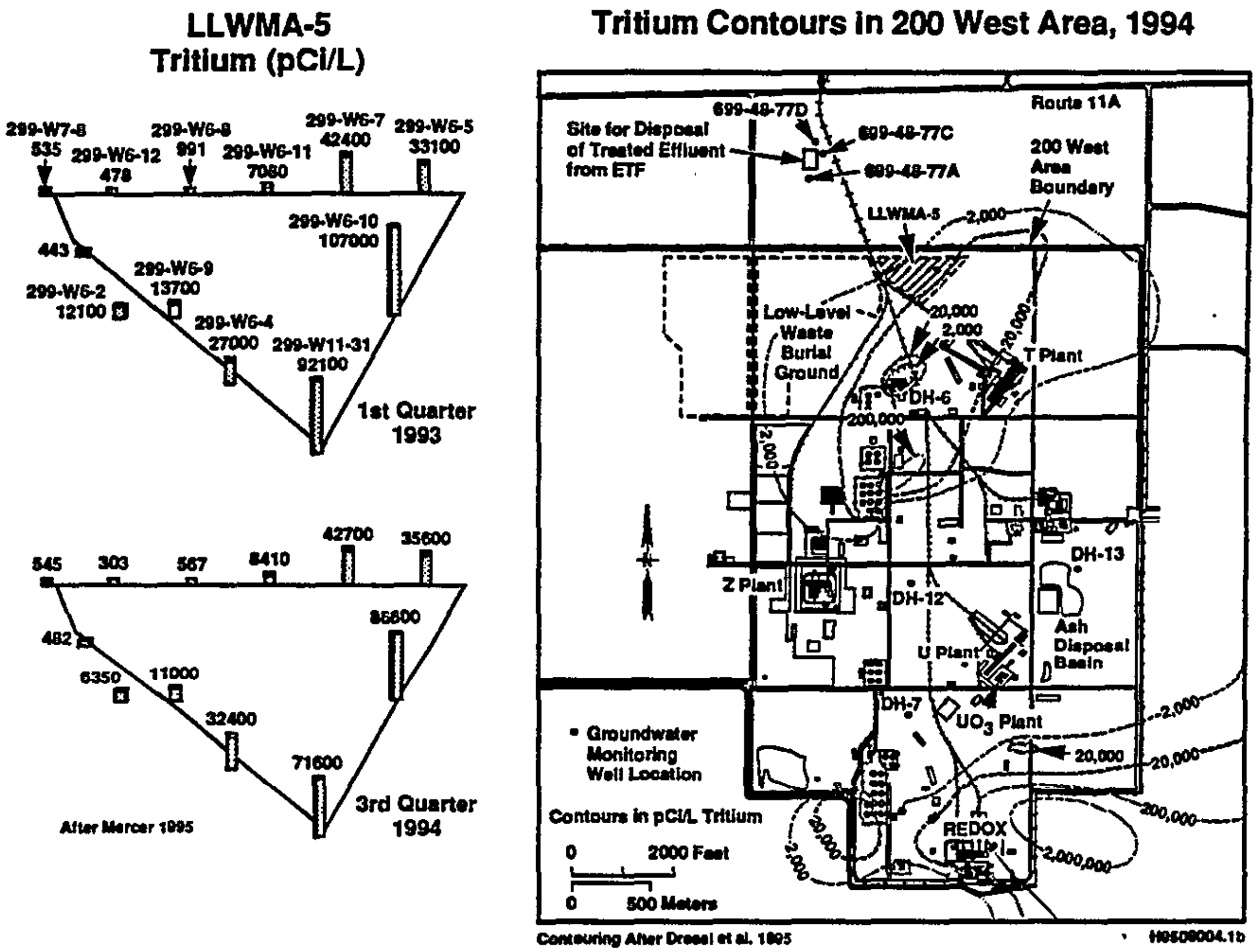
Figure 3-2 illustrates the results of tritium monitoring for Low-level Waste Management Area 5 (LLWMA-5) and the Ground-Water Surveillance Project. A tritium plume is emanating from the 200 West Area (Dresel et al. 1994), southeast of the disposal facility and due south of LLWMA-5. As the histograms in Figure 3-2 show, little change has occurred in the concentration of tritium at LLWMA-5 since the first quarter of 1993 (Mercer 1995). Currently, the northwest edge of the tritium plume is ~760 m (2,500 ft) southeast of the disposal facility.

Figure 3-3 shows nearby wells in the potential flow paths of treated effluent discharged to the disposal site. Most of the wells are currently monitored for tritium by the Ground-Water Surveillance Project. Sampling schedules and constituent monitoring lists for these wells are provided by Bisping (1995). Of the wells shown in Figure 3-3 that are not currently sampled, most are serviceable, and could be sampled for tritium, if needed. The wells farthest from the disposal site would be needed only after several decades of facility operation, based on travel times estimated for the treated effluent (see Section 2.4).

3.7.2 Wells Identified to Track Migration of Tritium from the Disposal Site

Figure 3-4 shows all serviceable ground-water monitoring wells near the facility. These wells are being monitored for tritium on a quarterly, semiannual, or annual basis by the RCRA/Operational Monitoring Program, Liquid Effluents Program, or the Ground-Water Surveillance Project. Consequently, these wells are proposed as the near-term tritium tracking wells required by Permit ST-4500. Table 3-2 lists pertinent information for the wells and Appendix E provides well construction details.

Figure 3-2. Tritium Concentrations in Ground Water in the Vicinity of the Disposal Facility.



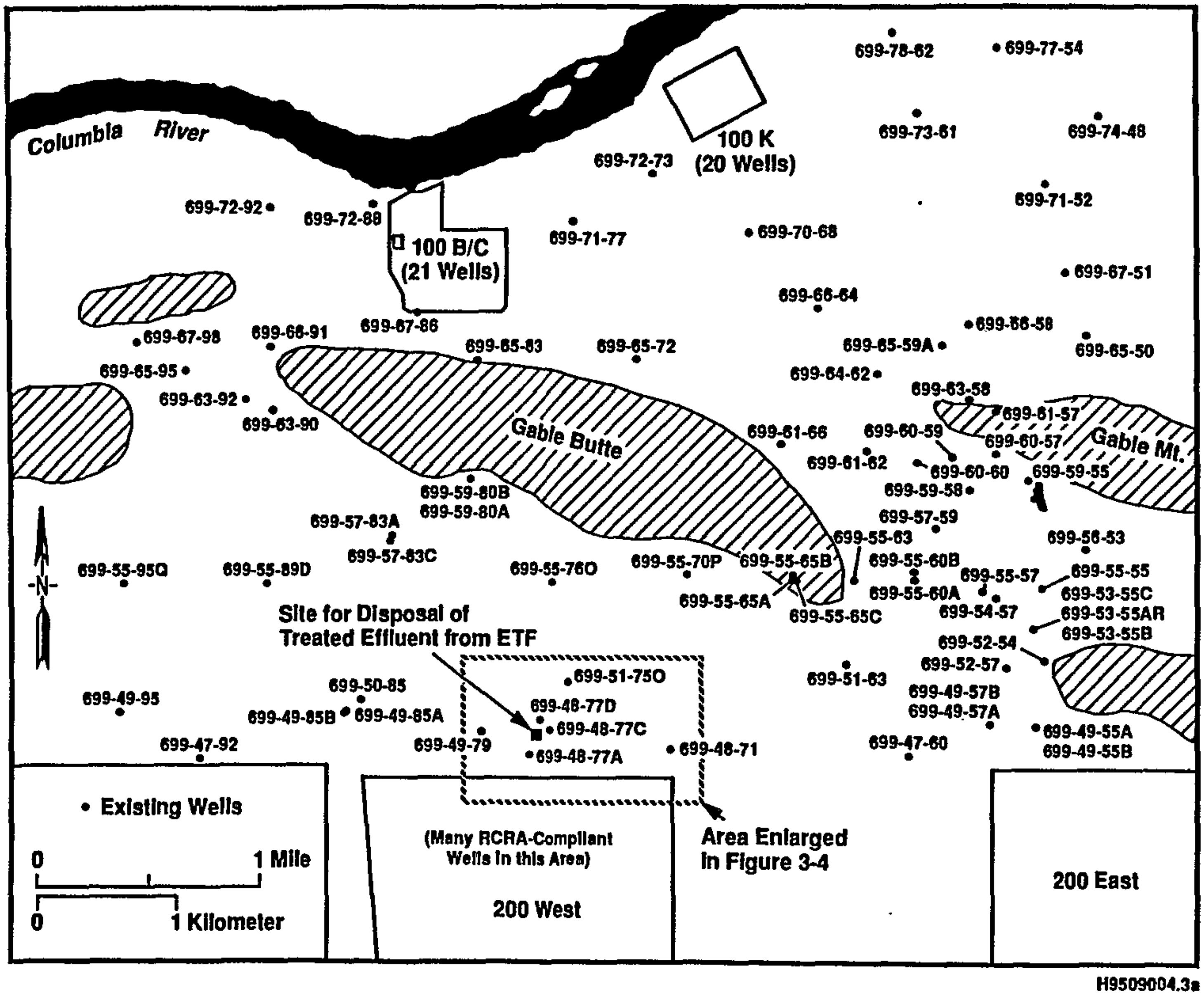


Figure 3-3. Well Locations in the Northern Portion of the Hanford Site.

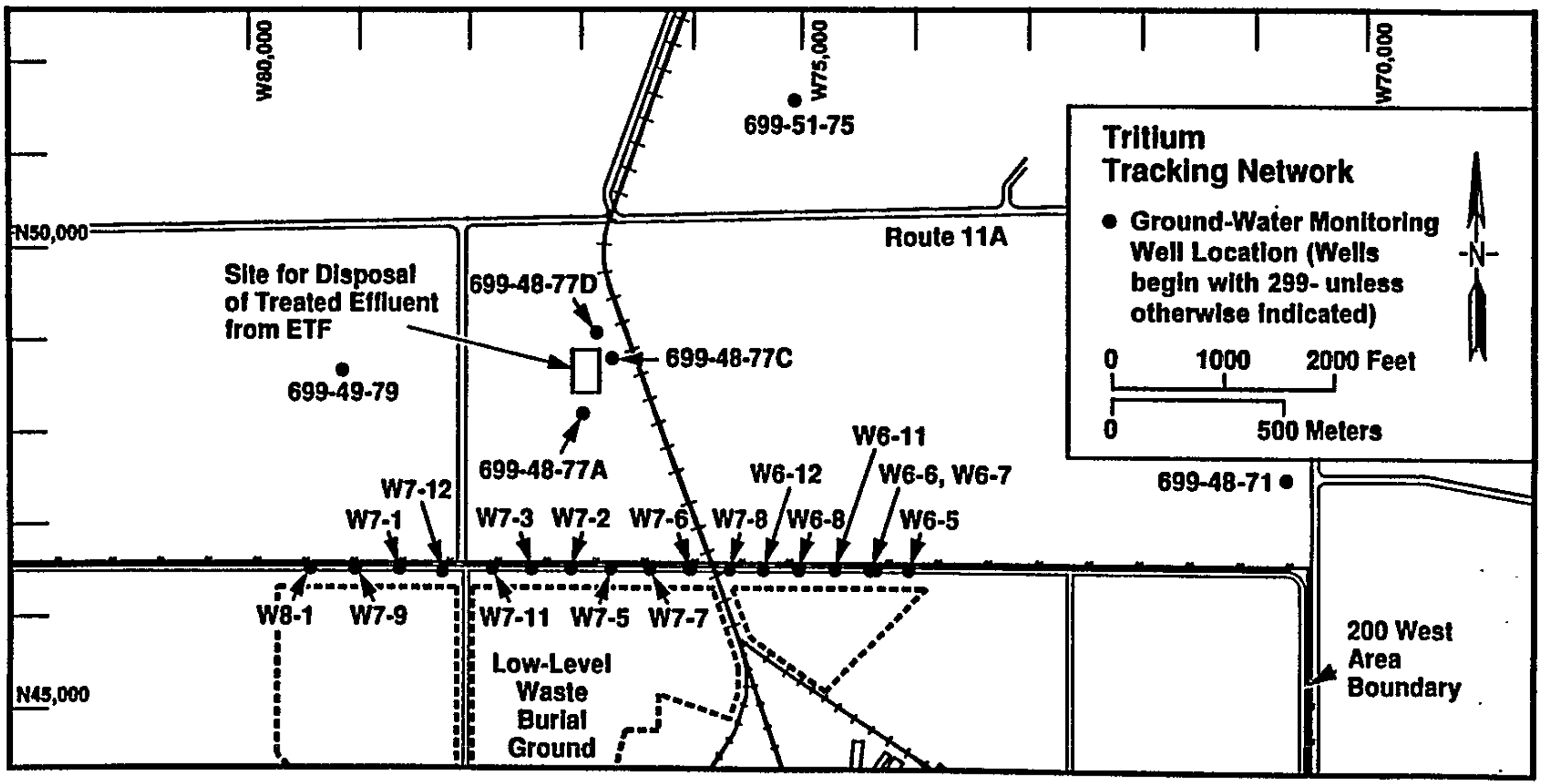


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Figure 3-4. Wells Proposed for Tracking the Movement of Tritium in the Vicinity of the Disposal Facility.

Table 3-3. Ground-Water Monitoring Wells Used to Track Tritium Discharged to the Disposal Facility.

Well number	Well location relative to facility	Well construction standard	Hydrogeologic unit and location of screen	Sampling frequency/ responsible organization
299-W6-5	upgradient	RCRA	Ringold; unconfined upper portion of aquifer	SA - R
299-W6-6	upgradient	RCRA	Ringold; unconfined, lower portion of aquifer	SA - R
299-W6-7	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W6-8	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W6-11	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W6-12	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-1	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-2	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-3	upgradient	RCRA	Ringold; unconfined, lower portion of aquifer	SA - R
299-W7-5	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-6	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-7	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-8	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-9	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-11	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W7-12	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
299-W8-1	upgradient	RCRA	Ringold; unconfined, upper portion of aquifer	SA - R
699-48-71	downgradient	pre-RCRA	Ringold; water table	SA - SW
699-48-77A	upgradient	RCRA	Ringold unit E; confined, upper portion of aquifer	Q - F
699-48-77C	downgradient	RCRA	Ringold unit E; confined, mid-to-lower portion of aquifer	Q - F
699-48-77D	downgradient	RCRA	Ringold unit E; confined, upper portion of aquifer	Q - F
699-49-79	downgradient	pre-RCRA	Ringold	A - SW
699-51-75	downgradient	pre-RCRA	Ringold; confined (?)	A - SW

A = annually
SA = semiannually
Q = quarterly
R = RCRA monitoring
SW = PNL Ground-Water Surveillance Project
F = Disposal facility for the 200 Areas ETF

Wells 699-48-77C, 699-48-77D, 699-48-71, and 699-51-75 are hydraulically downgradient of the disposal site, as depicted in Figure 2-12. Well 699-48-71, although technically downgradient, is not within a probable flow path of the treated effluent. However, this well and well 699-49-79, are currently sampled by the Ground-Water Surveillance Project and are selected for monitoring because of their proximity to the facility.

Well 699-48-77A and 17 wells around the LLWBG facilities to the south are hydraulically upgradient from the disposal site. These wells were selected for inclusion in the tritium tracking network primarily for two reasons: (1) to provide for the contingency that treated effluent discharged to the facility could flow southward (down slope) along the top of the relatively-impermeable Plio-Pleistocene/early "Palouse" soil unit and (2) to monitor the movement of the tritium plume southeast of the facility. As noted in Section 3.7.1, historical trends and hydrogeologic data indicate that movement of plume toward the facility is unlikely. However, monitoring of the tritium plume originating in the 200 West Area will continue to determine whether the changing hydraulic potential in the area changes the current direction of movement of this tritium plume, and to distinguish this plume from that which will emanate from the disposal facility.

Tritium monitoring will be conducted in two stages. The first stage will consist of quarterly monitoring of the three facility wells (699-48-77A, 699-48-77C, 699-48-77D), the 17 wells in the LLWBG, and annual monitoring of wells 699-48-71, 699-49-79, and 699-51-75 (Table 3-3). This approach will provide the nearby and near-term monitoring of the effluent to allow recalibration of predictive models, and will also allow monitoring of hydraulic and chemistry conditions surrounding the facility. The monitoring of ground water south of the facility will assist in distinguishing the facility effects on ground water from effects originating in the 200 West Area. The effectiveness of the network will be evaluated either (1) no later than 4 yr after the current permit (ST-4500) was issued, or (2) within 1 yr of the initial detection of tritium in a tritium-tracking well, whichever occurs first. The predictive model will be updated to incorporate the latest data from ground-water monitoring (Section 3.8). Based on the results of ongoing monitoring and model revision, needs for additional well coverage can be confidently assessed, and contingency measures formulated (Permit Section S.7 [B]), as needed.

The second stage of monitoring will occur as treated effluent travels beyond the immediate vicinity of the facility and the five, nearby, monitoring wells. Tritium will then be monitored by the more distant wells shown in Figure 3-3. If current model predictions are verified, this stage will occur several years, to decades, following facility startup.

If tritium monitoring in any well identified in Table 3-3 is discontinued by the existing programs, the importance of the well to the tritium tracking network established for Permit ST-4500 will be reevaluated by the Liquid Effluents Program. If the need for continued monitoring of the well is determined to be critical to the effectiveness of the network, tritium sampling and analysis will be continued in that well.

3.7.3 Evaluation of Monitoring Network

Ground-water flow velocities and tritium travel times from the discharge site to the Columbia River have been estimated by numerical modeling. Based on the modeling, the time required for tritium discharged at the disposal site to be observed in ground-water monitoring wells surrounding the facility can be estimated. The current estimates will be updated based on the results of planned direct measurements of ground-water flow and head measurements, and consequent refinement of modeling input data. The increased hydraulic head from facility operation will also be determined and accounted for in model predictions.

If the arrival time of treated effluent at selected downgradient monitoring wells significantly differs from the times predicted by direct measurement and modeling methods, consideration may be given to installing additional monitoring wells. If needed, these wells would provide additional areal coverage to ensure interception of the treated effluent. The discrepancy between predictions and observations that will be allowed before new wells are installed will be determined by the facility compliance officer.

3.8 UPDATE OF NUMERICAL ANALYSES OF THE EFFECTS OF FACILITY OPERATION ON THE UPPERMOST AQUIFER

In accordance with the requirements of Permit ST-4500, Section S7.B, this section contains plans for updating and maintaining predictive, computer-encoded conceptual and numerical models used to predict ground-water flow and tritium transport originating at the disposal facility. The ground-water flow and contaminant transport models described in Section 2.4.3 will be replaced by a revised and recalibrated model that will provide output which can be compared with that of the Golder Associates model (1991).

The 1991 analyses will be updated by using current information on the volume, composition, and durations of treated effluent discharges to the facility, site-specific hydrogeologic information collected since the date of the last analyses, and by using water-quality and hydraulic-head data obtained from tritium-tracking wells (see Section 3.7) during the initial 5-yr period of facility operation authorized by the current discharge permit. The initial update will be completed no later than 4 yr after the current permit was issued, or within 1 yr of the initial detection of tritium in the tritium-tracking well network, whichever comes first. Results of each update will be presented in a format similar to that of Section 2.4.3.

Ground-water flow predictions will be revised at least once during the 5-yr term of each successive discharge permit issued during the operating life of the facility. Revised predictions will be made no later than 4 yr after the beginning of the term of each successive permit. After each recalibration of the model using new data, ground-water flow and tritium transport will be simulated to revise the prediction of the time required for tritium to travel from the facility to the Columbia River, and its concentration at the time and location of its arrival at the river.

In the event that the concentration of tritium in the plume of treated effluent is predicted, by numerical analysis, to exceed the regulatory standard in the area of discharge to the Columbia River, a list of proposed contingency measures will be submitted to Ecology within 90 days.

3.8.1 Initial Baseline Analysis Update

Predictions of the movement of tritium from the disposal facility to the Columbia River previously were made by Golder Associates and published as WHC reports (Golder Associates 1990, 1991). After these reports were issued, the assumptions for the effluent to be processed by the ETF and the expected schedule for operating the ETF changed. Since construction of the ETF, the need to operate the 242-A Evaporator to concentrate liquid wastes from the tank farms has diminished and wastewater previously expected to feed the ETF has not materialized because of the shutdown of the

PUREX Plant. Therefore, projected volumes of treated effluent to be discharged and its estimated tritium concentration have been revised downward.

Consequently, assumptions based on the previously projected volume of effluent to be discharged, earlier estimates of the concentration of tritium in that discharge, and past predictions of the durations and rates of the discharge may no longer apply. The results from the 1991 model are subject to uncertainty resulting from shortcomings in the assumptions used. However, the uncertainties were managed in a conservative manner; therefore, they tend to equal the concentration of tritium reaching the Columbia River to be overestimated and the travel time to be underestimated. Furthermore, these assumptions will likely continue to change as various 200 Area facilities are deactivated, and waste management and ground-water remediation plans are revised and refined. In addition, newer, more detailed hydrogeologic information and more sophisticated numerical models have become available since 1991.

Newly reported data include:

- Refinement of site-specific hydrostratigraphic information based on lithologic logging of monitoring wells 699-48-77C and 699-48-77D (see Section 2.3.2.2)
- Results of hydraulic testing in three zones of the uppermost aquifer intercepted by well 699-48-77C (see Section 2.3.3.3)
- Direct measurement of the direction and velocity of ground-water flow in the three monitoring wells immediately adjoining the disposal facility (see Section 2.3.3.4)
- The results of previously unreported infiltration tests at the disposal site (see Section 2.3.6.2) and analyses of sediment chemistry (see Section 2.3.6.3).

The timing of the recalibration of a new flow and transport model using the above data will depend, in part, on when tritium is first observed in wells closest to the facility. Once tritium is detected in one or more of the wells, recalibration of the models using the well observation data will be initiated. Alternatively, if tritium is not detected by a monitoring well during the first 4 yr of disposal facility operation, recalibration of the 1991 model will proceed using all other information that has become available since 1991. In either case, the results of the initial recalibration will be published at least 6 months prior to the end of the 5-yr term of Permit ST-4500, or within 1 yr of initial detection of tritium from the facility in an observation well.

3.8.2 Periodic Recalibrations

After expiration of the initial 5-yr term of Permit ST-4500, periodic recalibrations of the ground-water flow and tritium transport models will be needed as additional monitoring data become available from the tritium tracking wells. Consequently, at least one recalibration and updated prediction of tritium transport will be completed during the term of each 5-yr permit issued during the life of the facility.

Because the current permit is valid only for effluent treated by the ETF that originates from the 242-A Evaporator, additions of effluent from other sources for treatment at the ETF would require application to Ecology for revision of the current discharge permit or issuance of a new permit. In these instances, recalibration of the conceptual and numerical models using new scenarios for the volumes and compositions of effluent to be treated by the ETF may be completed to support the new or revised application. Potential sources of effluent to be treated at the ETF include, for example, contaminated water pumped from wells in the 200-UP-1, 200-ZP-1, or other ground water operable units.

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4.0 REPORTING OF MONITORING RESULTS

After startup of facility operations, quarterly monitoring of the two downgradient wells and the upgradient well will continue (Table 4-1). The applicable data from the monitoring for constituents listed in Permit ST-4500, Section S1.A, will be published in quarterly reports, in compliance with Permit ST-4500, Section S7.C. The data in these reports will be compared to the Enforcement Limits and Early Warning Values in ground water as described, respectively, by Permit ST-4500, Sections S1.A and S1.C. Any additional analyses of pollutants using test procedures specified by the permit will be included in calculation and reporting of data submitted in the discharge monitoring report, as required by Section G17 of Permit ST-4500. All reports submitted will be signed and certified in accordance with Section G18 of Permit ST-4500.

Table 4-1. Schedule for Monitoring of Wells.

Well	Aquifer	Sampling frequency	Water-level measurement	Well construction standard
699-48-77A	Uppermost	Quarterly[a]	Monthly	RCRA
699-48-77C[b]	Uppermost	Quarterly[a]	Monthly	RCRA
699-48-77D[b]	Uppermost	Quarterly[a]	Monthly	RCRA

[a] Quarters are defined as January though March, April through June, July through September, and October through December.

[b] Enforcement Limits and Early Warning Values will be met in ground water collected from the points of compliance in these wells.

Results of tritium monitoring in ground water from the wells listed in Table 3-3 will be reported annually, within 60 days after the anniversary of the beginning of treated effluent discharge. These results will be transmitted to Ecology as a separate report or will be incorporated into quarterly ground-water monitoring reports, as described above for permit condition S7.B. Tritium concentrations in ground water samples from the three facility wells (699-48-77A, 699-48-77C, and 699-48-77D) will also be reported in the quarterly ground-water monitoring reports.

Section 3.7 of this ground-water monitoring plan is the tritium tracking plan required by Section S7.B of Permit ST-4500. The plan for updating and maintaining the computer-encoded numerical models of ground-water flow and tritium transport required by Section S7.B of Permit ST-4500 is Section 3.8. The results from the update will be used to predict tritium arrival times at the tritium-tracking wells and the Columbia River, and tritium concentrations in the uppermost aquifer. Reports of the periodic model recalibrations and updated predictions, using the tritium tracking data required by Section S7.B of Permit ST-4500 will be issued at least once per 5-yr permit cycle.

All associated records will be maintained in accordance with Permit ST-4500, Section G12, and as specified by WHC implementation procedures. The reports will be maintained in various forms and locations which will be accessible at the 200 Area offices of Liquid Effluent Services.

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APPENDIX A

WELL LOGS FOR THE TREATED EFFLUENT DISPOSAL FACILITY

CONTENTS

Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION		Well No: 699-48-77A		Page 1 of 6	
Date Started: 1-21-92	Date Completed: 5-19-92	Total Depth:	457.70	Static Water Level:	215.40
Location: NORTH OF 200 WEST		Surface Elevation:	672.25	Casing Elevation:	674.72
		Northing:	137969.02	Easting:	566413.57
Prepared By: DJ ANDERSON/C WRIGHT		Hanford N:	47602.70	Hanford W:	77020.00
Drilling Co: JENSEN	Driller: D PERKINS	Drill Meth:	CABLE TOOL	Drill Equip:	SPEED STAR 60

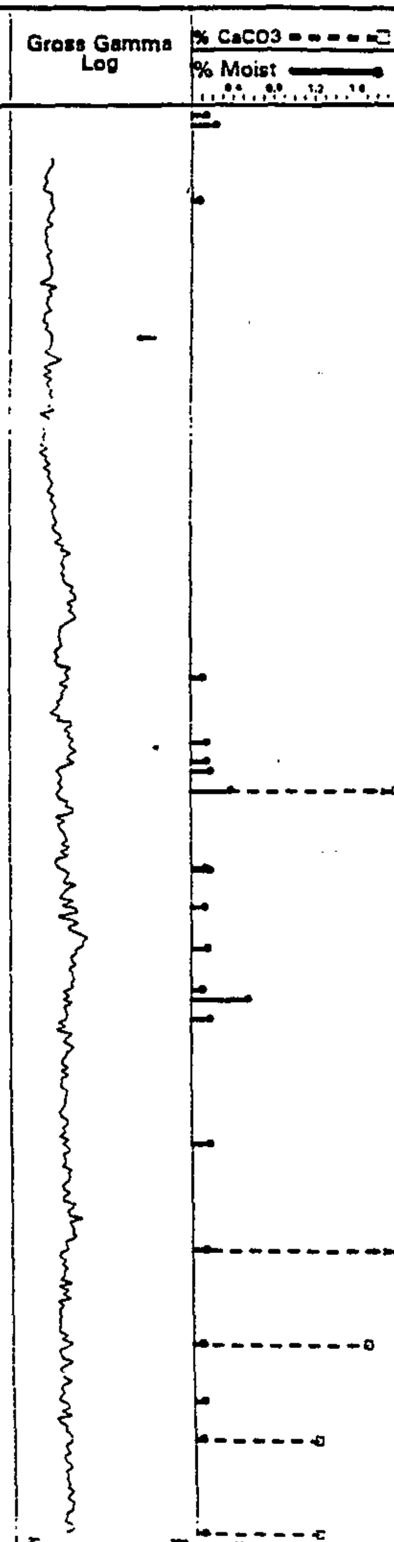
Screen: 20.3' OF 4" DIAM 10-SLOT T-304 STAINLESS STEEL CONTINUOUS WIREWRAP W/ENDCAP SET FROM 212.4' TO 232.7'

Filter Pack: 20-40 MESH SILICA SAND FROM 206.7' TO 237.1'

Permanent Casing: 4" DIAMETER TYPE 304 SCHEDULE 5 STAINLESS STEEL WITH CENTRALIZERS SET TO 212.4'

Comments: SPECTRA GAMMA LOG WAS PERFORMED.

Elev'n (Feet) / Depth (Feet)	Remarks/ Materials Used	Well Construction	Drill Method	Graphic Lithologic Log	Misc XRF = F XRD = D
-670	CEMENT (0.0' TO 8.0')			0-1.5' Slightly silty sandy GRAVEL EOLIAN/HANFORD CONTACT AT 1.5'	
				1.5-3' Slightly gravelly SAND	
				3-5' Sandy GRAVEL	F
				5-10' Slightly silty sandy GRAVEL	
10				10-20' Silty sandy GRAVEL Minor cementation with white leach type staining (10-15')	F
-660					F
20	16" TEMPORARY CARBON STEEL CASING SET AT 19.71'			Non-CaCO3 cementation at 18.9'	
				20-22.5' Silty gravelly SAND	F
-650				HANFORD/PLIO-PLEISTOCENE CONTACT AT 22.5'	
				22.5-45' Slightly silty, slightly gravelly SAND Silt lens (22.5-22.6') Silt lens (24.5-25.5')	F
30				Caliche lens (29-29.4') Possible caliche stringers (30-35')	F
-640				Cemented sand (32.6-32.8')	F
	8-20 MESH BENTONITE CRUMBLES (8.0' TO 199.1')		DB	Caliche (35.3-35.8')	F
				Cemented sand (37.9-38')	F
40					F
-630				Silt lens (42-42.5') Possible silt stringers (42-45')	
				45-50' Slightly silty SAND Silt lens at 46.5' Possible silt stringers at 47.5'	F
50				50-55' Slightly silty, slightly gravelly SAND	F
-620				Very loose sand	F
				Silt at 52'	F
				Caliche at 53.5'	F
				Cemented sand (54-54.3')	F
				55-63.6' Sandy SILT	F
				Silt lens at 58' Cemented sand below silt	F
60				60-65' Slightly silty, sandy GRAVEL Caliche (60.3-60.5')	F
-610				Minor CaCO3 cementation (63-63.9') PLIO-PLEISTOCENE/UPPER RINGOLD CONTACT AT 65'	F
				65-82.5' Slightly silty, slightly gravelly SAND	
70					
-600					

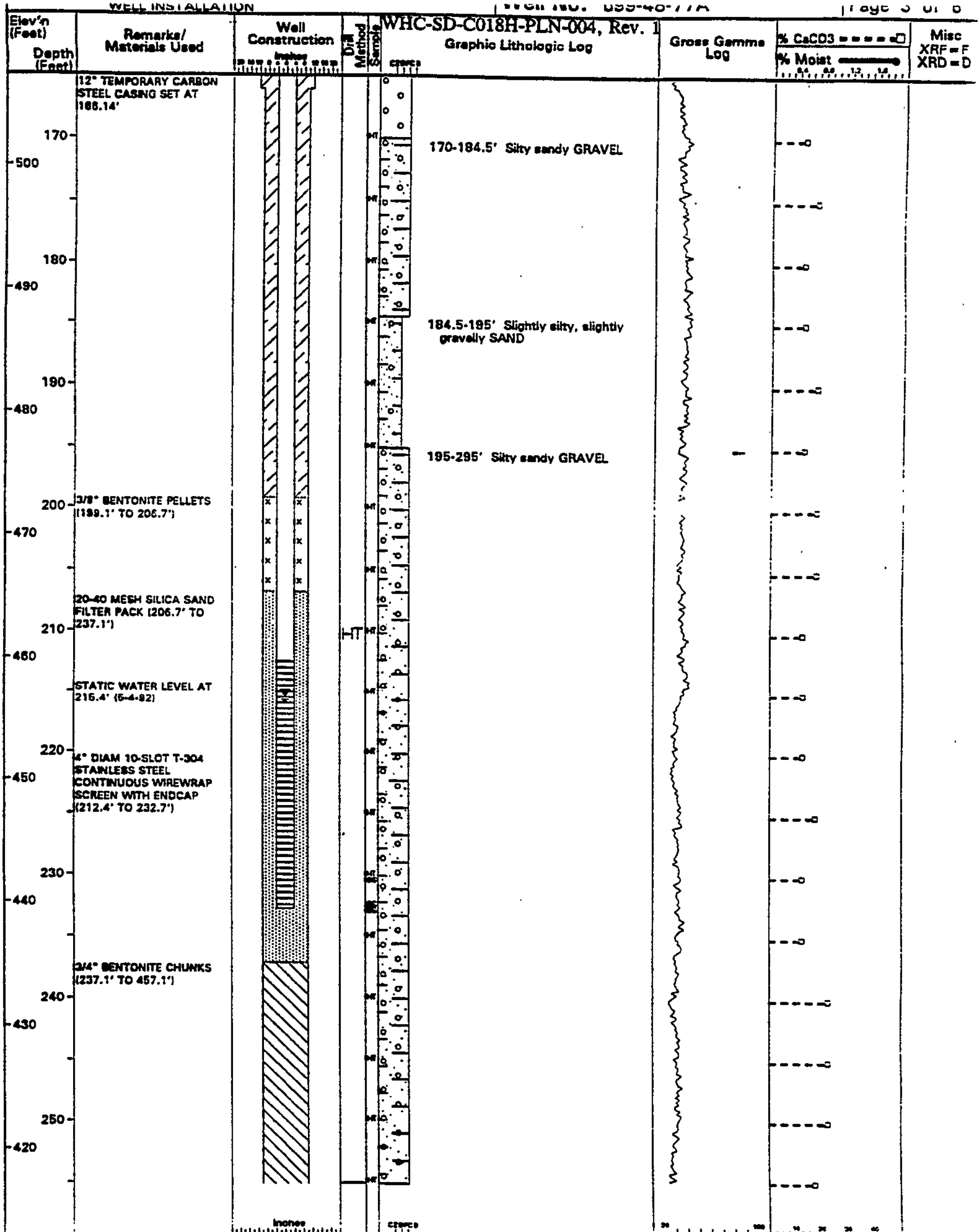


Reviewed By: Kent D. Reynolds / KDR Date: FEB. [illegible]

Elev'n (Feet) / Depth (Feet)	Remarks/ Materials Used	Well Construction (Inches)	Drill Method	Sample	Graphic Lithologic Log	Gross Gamma Log	% CaCO3 / % Moist	Misc XRF = F XRD = D
80								
590					UPPER RINGOLD/RINGOLD E CONTACT AT 82.5'			
	4" DIAM T-304 SCH 5 STAINLESS STEEL PERM CASING W/CENTRALIZERS				82.5-95' Sandy GRAVEL			
90								
580								
					Slightly silty (95-125')			
100					Added water to hole for better recovery (100-136.5')			
570								
			DB					
110								
560								
					Sand lens (115.5-115.7')			
120								
550								
					No silt (125-135')			
130								
540								
					135-170' Slightly sandy GRAVEL			
140								
530								
150			HT					
520								
160								
510								

Reviewed By: Kent D. Reynolds / KDR

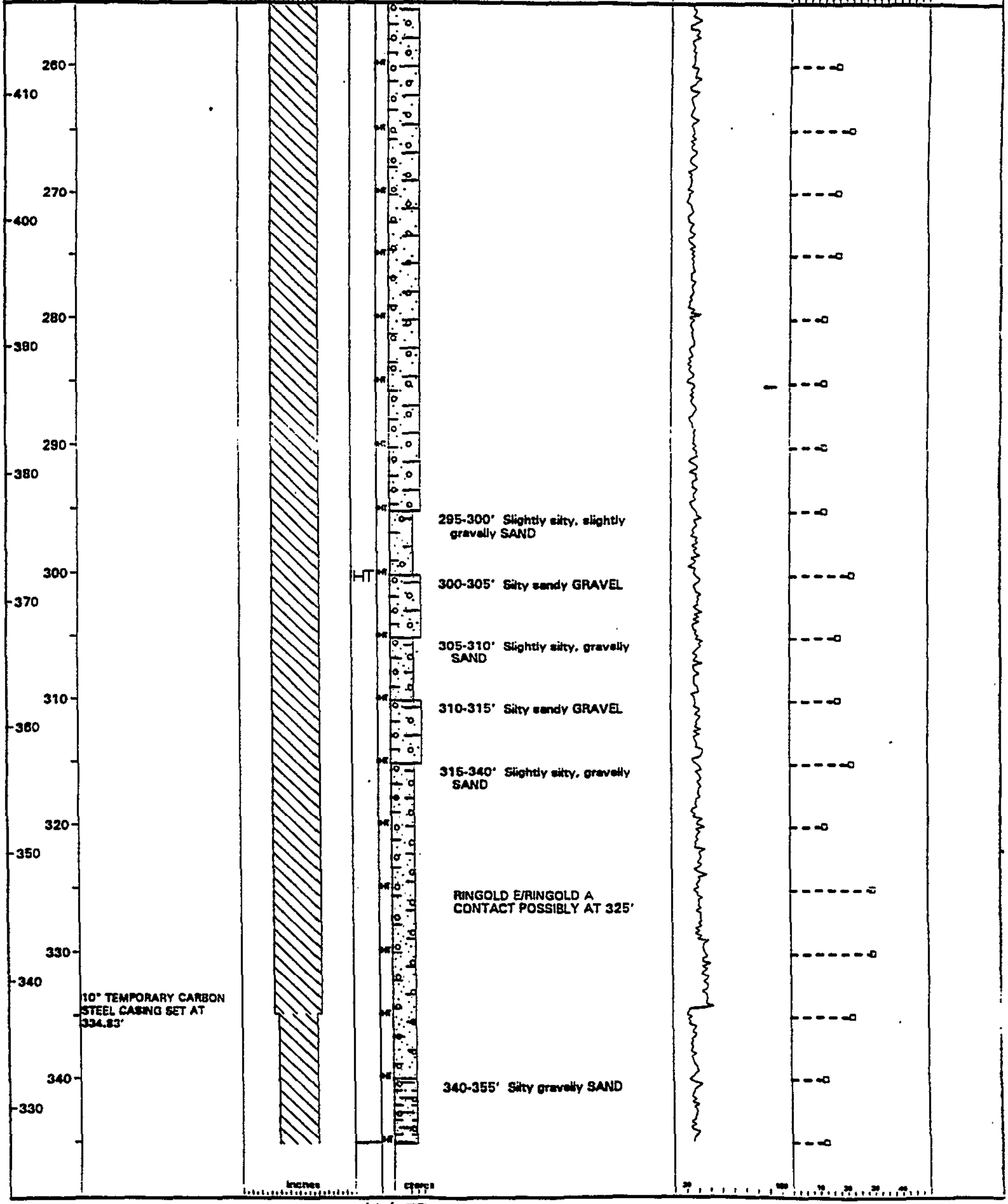
Date: FEB. 1 2 1993



Reviewed By: Kent D. Reynolds / KDR Date: FEB 12 1993

WHC-SD-C018H-PLN-004, Rev. 1

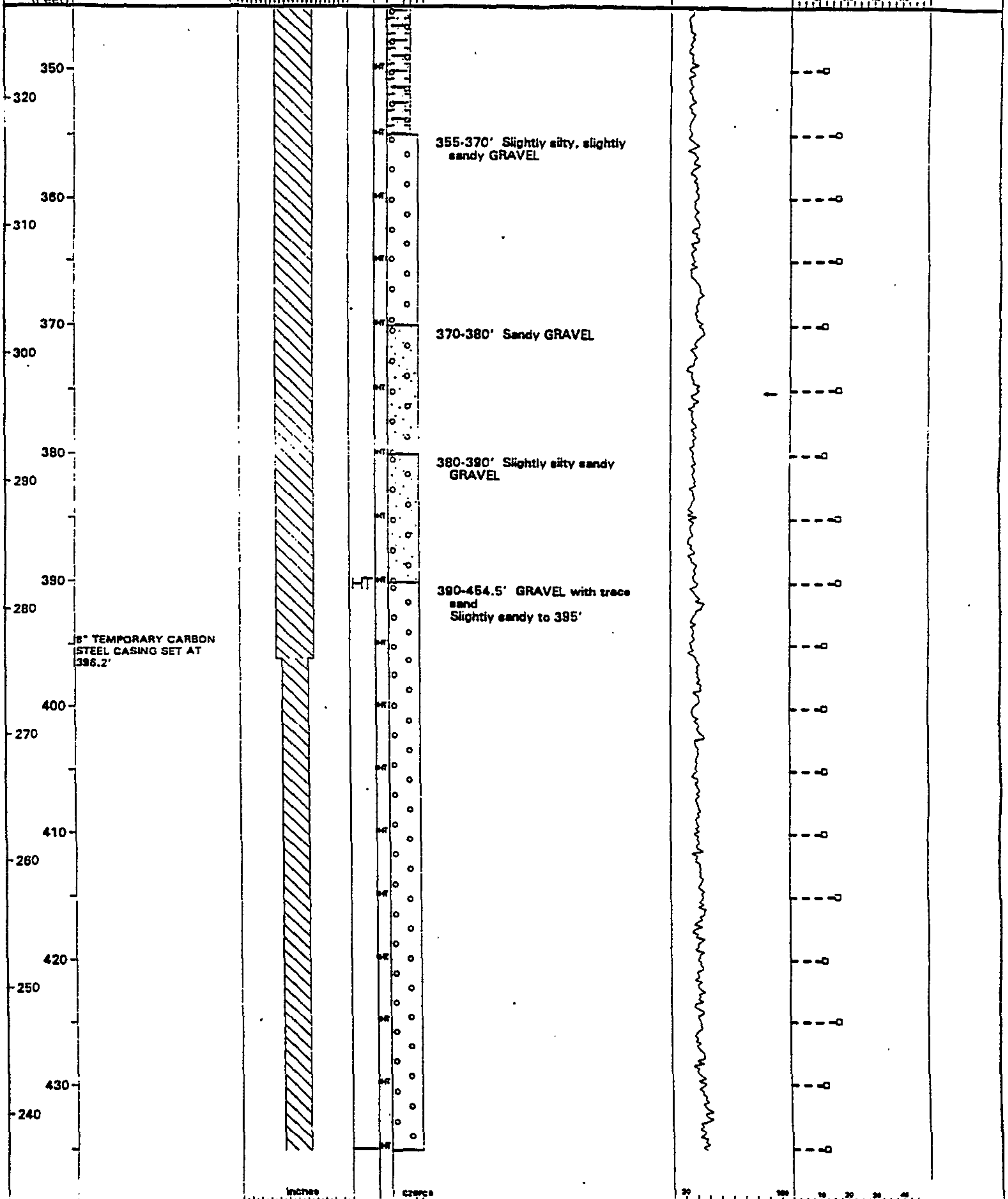
Elev'n (Feet) / Depth (Feet)	Remarks/ Materials Used	Well Construction (inches)	Drill Method	Sample	Graphic Lithologic Log	Gross Gamma Log	% CaCO3 / % Moist	Misc XRF = F XRD = D



Reviewed By: Kent D. Reynolds //KDR Date: FEB. 1 2 1993

RCRA GROUNDWATER MONITORING WELL INSTALLATION | **Well No: 699-48-77A** | **Page 5 of 6**

Elev'n (Feet) / Depth (Feet)	Remarks/ Materials Used	Well Construction (Inches)	Drill Method	Sample	Graphic Lithologic Log	Gross Gamma Log	% CaCO3 / % Moist	Misc XRF=F XRD=D



Reviewed By: Kent D. Reynolds / KDR

Date: FEB. 1 _ 1999

WHC-SD-C018H-PLN-004, Rev. 1

Elev'n (Feet) / Depth (Feet)	Remarks/ Materials Used	Well Construction (Inches)	Drill Method	Sample	Graphic Lithologic Log	Gross Gamma Log	% CaCO3 / % Moist	Misc XRF=F XRD=D

440 — 230

6" TEMPORARY CARBON STEEL CASING SET AT 447.65'

HT

450 — 220

Sand interval with trace gravel (452-454.5')

454.5-457.7' ELEPHANT MOUNTAIN BASALT

SLUFF (457.1' TO 457.7')
TOTAL DEPTH = 457.7'

460 — 210

470 — 200

480 — 190

490 — 180

500 — 170

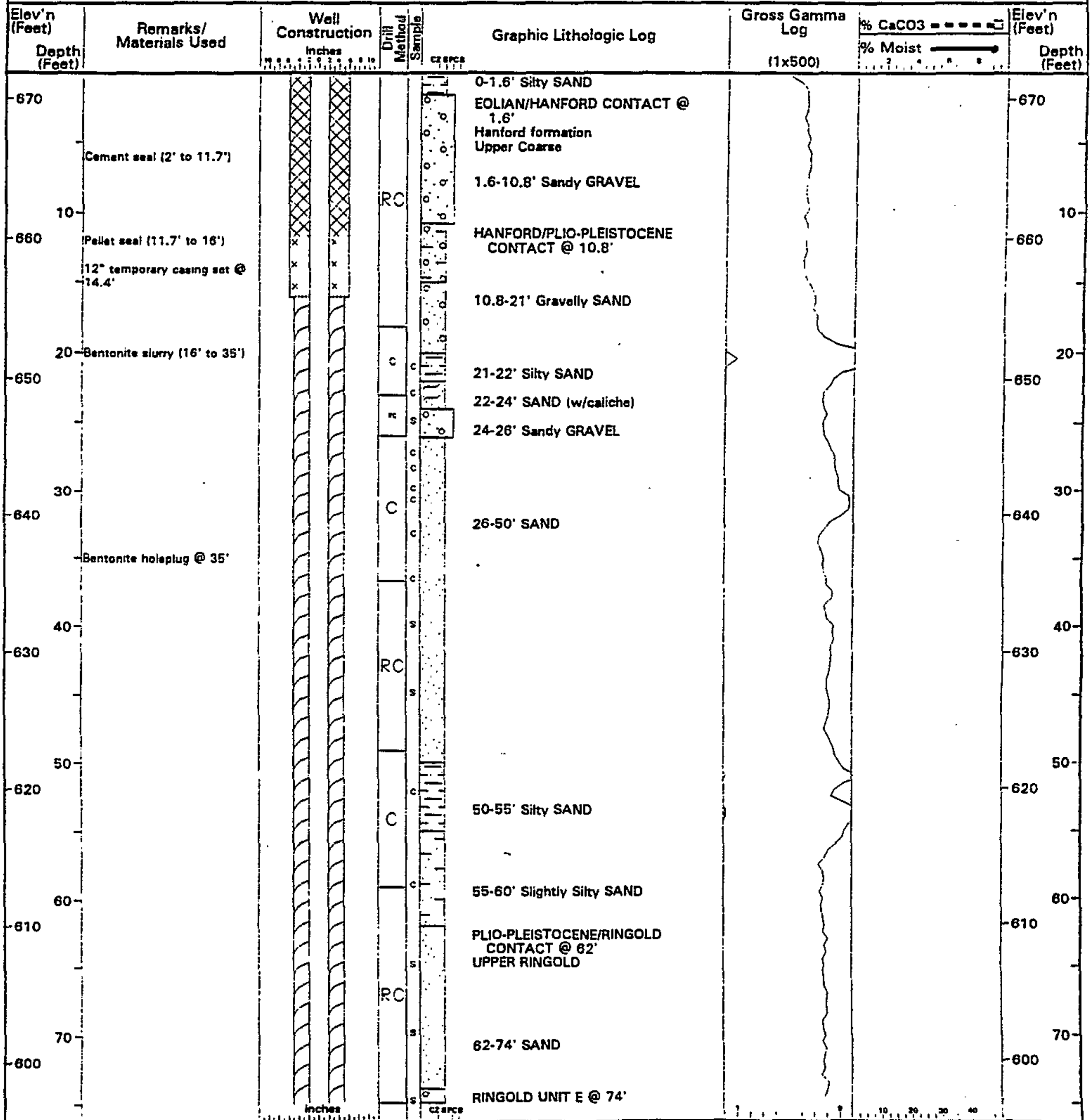
510 — 160

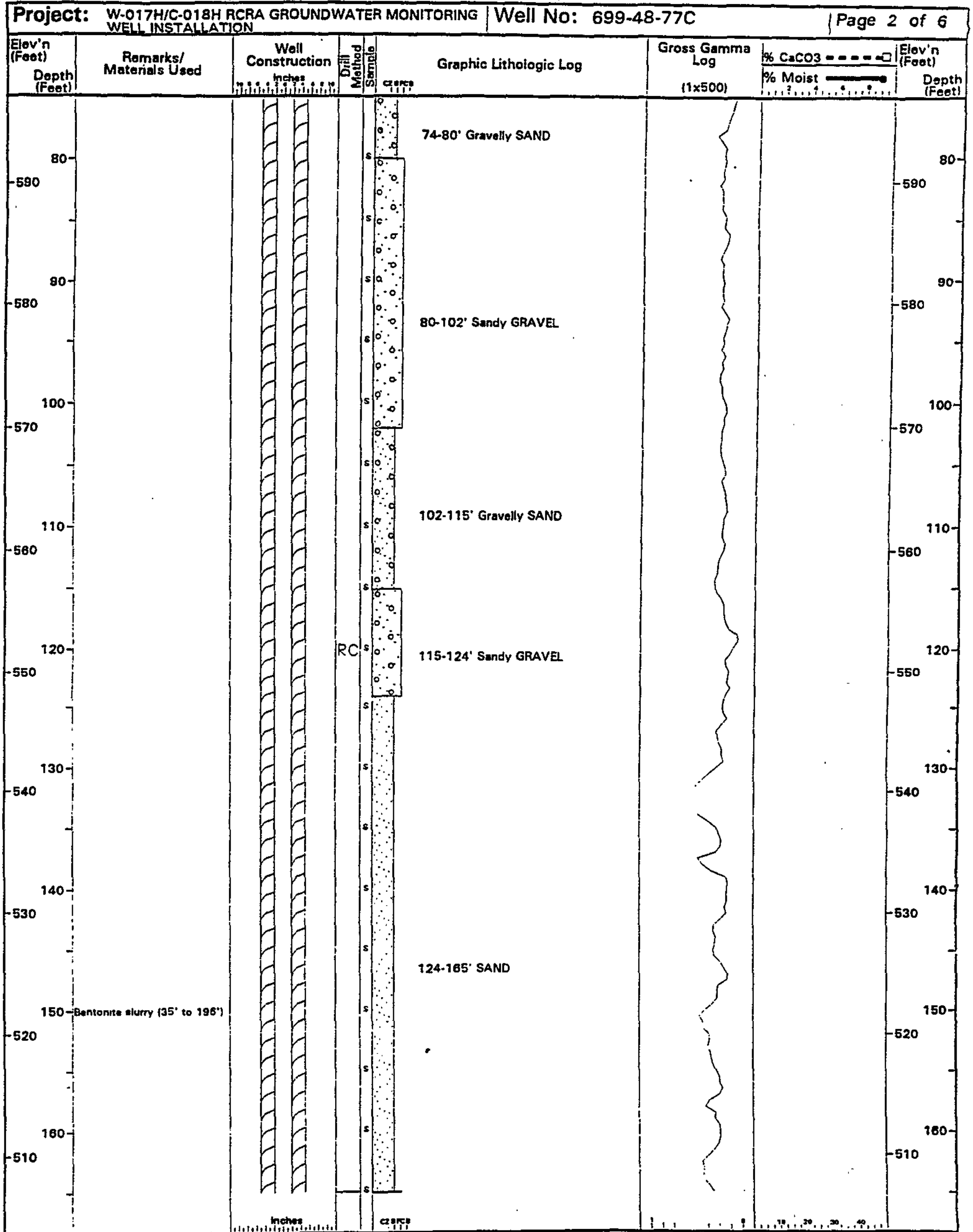
520 — 150

Reviewed By: Kent D. Reynolds / KDR

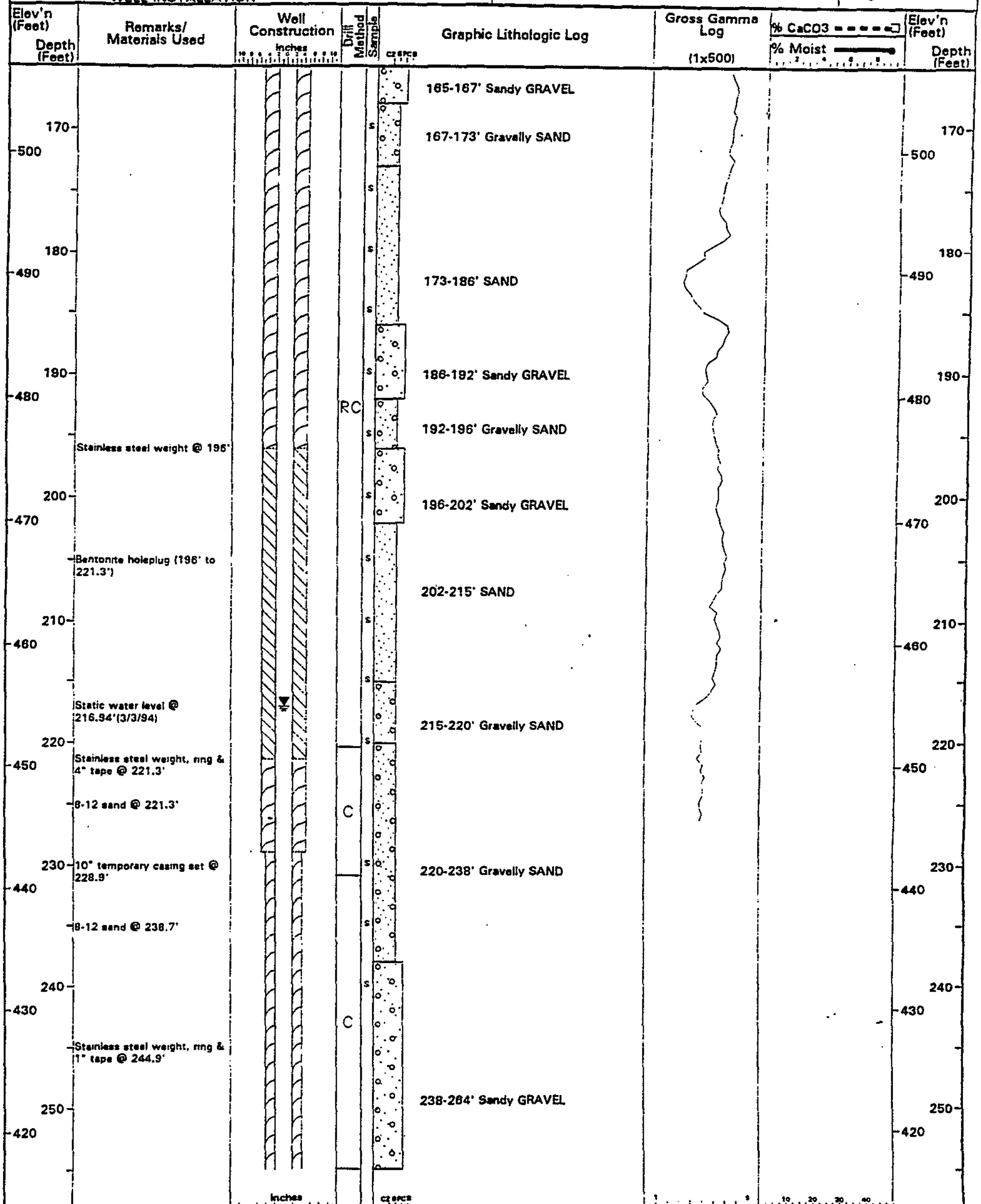
Date: FEB 1 2 1993

Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION		**Well No:** 699-48-77C	Page 1 of 6
Date Started: 1-31-94	Date Completed: 5-11-94	Total Depth: 437.20	Static Water Level: 216.94
Location: C018H		Surface Elevation: 671.91	Casing Elevation: 674.28
Prepared By: Templeton/Flinn		Northing: 138086.80	Easting: 566468.95
Drilling Co: PC Exploration	Driller: D KETTLE	Hanford N: 47989.32	Hanford W: 76836.16
		Drill Meth: Air Rotary	Drill Equip: Top Drive
Screen: 4" 20 slot SS screen set at 290 to 310 ft bgs			
Filter Pack: 10-20 sand set at 286.6 to 310 ft bgs			
Permanent Casing: 4" SS set from 3.1 ft above grade to 290 ft bgs			
Comments: FIRST WELL COMPLETION ABANDONED. WELL REDRILLED TO 314.4' AND COMPLETED TO SURFACE.			




Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION
Well No: 699-48-77C
Page 2 of 6
Elev'n (Feet) Depth (Feet)
Remarks/ Materials Used
Well Construction
Inches
Drill Method
Sample
Graphic Lithologic Log
Gross Gamma Log (1x500)
% CaCO3
% Moist
Elev'n (Feet) Depth (Feet)
74-80' Gravelly SAND
80-102' Sandy GRAVEL
102-115' Gravelly SAND
115-124' Sandy GRAVEL
124-165' SAND
RC
Bentonite slurry (35' to 196')
80
90
100
110
120
130
140
150
160
590
580
570
560
550
540
530
520
510

Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION | **Well No:** 699-48-77C | Page 3 of 6

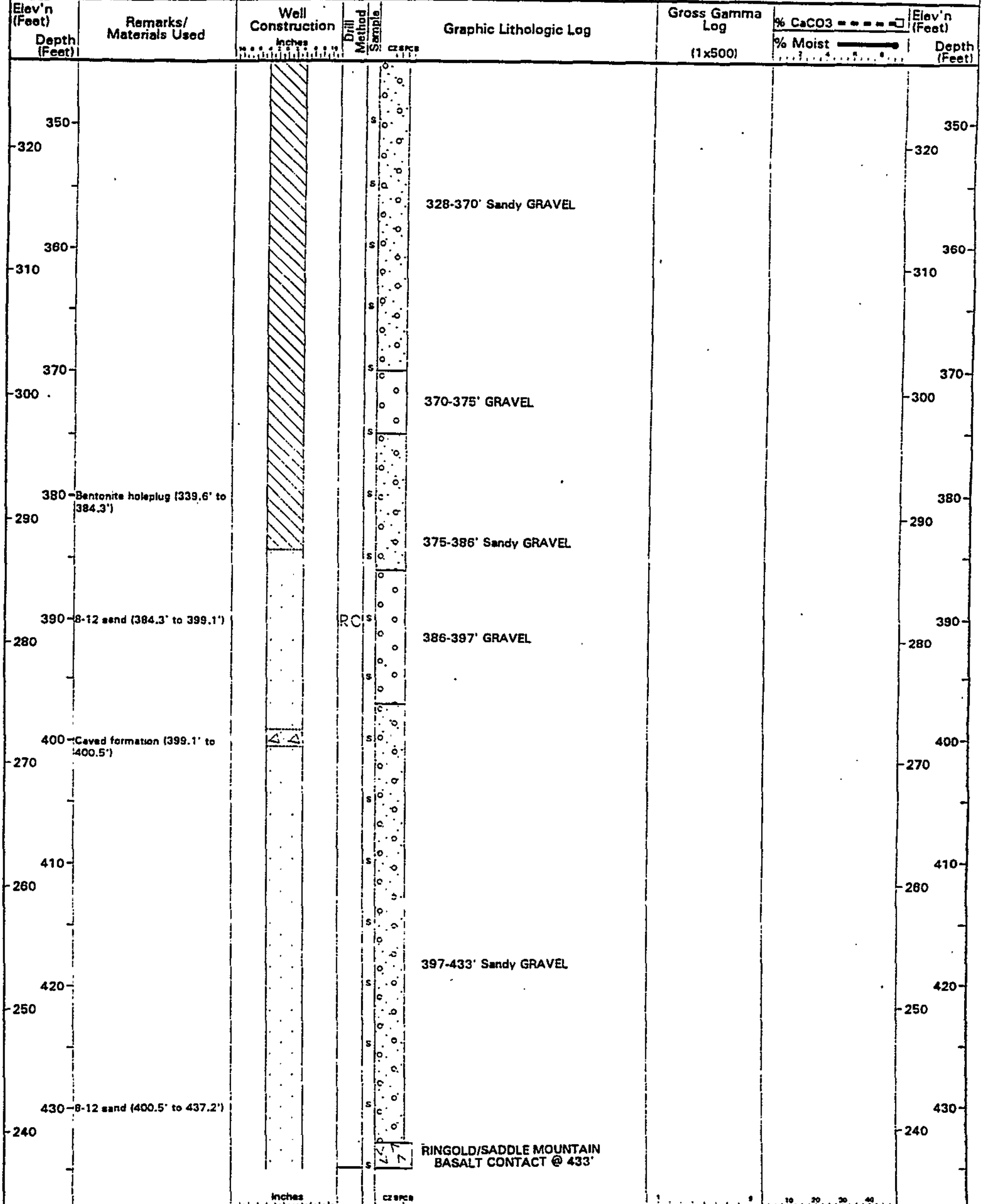


Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION | **Well No:** 699-48-77C |

Depth (Feet)	Elev'n (Feet)	Remarks/ Materials Used	Drill Method	Graphic Lithologic Log
260	410	Bentonite slurry (221.3' to 282.2')		
				264-266' GRAVEL
		Stainless steel weight, ring & 4" tape @ 267.3'		
270	400			
280	390			
		20-40 sand (282.2' to 286.6')		
290	380	10-20 sand (286.6' to 310.9')		
300	370		RC	266-321' Sandy GRAVEL
		20 slot stainless screen (290' to 310')		
310	360	8-12 sand (310.9' to 313.1')		
		Caved formation (313.1' to 314.1')		
320	350	Bentonite holeplug (314.1' to 323.8')		
				321-328' Silty SAND
330	340			
		Cement grout (323.8' to 339.5')		
340	330			

Column headings: Well Construction (Inches); Sample; Gross Gamma Log (1x500); % CaCO3; % Moist

Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION | **Well No:** 699-48-77C |



Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION | **Well No:** 699-48-77C | Page 6 of 6

Elev'n (Feet) / Depth (Feet)	Remarks/ Materials Used	Well Construction (Inches)	Drill Method	Sample	Graphic Lithologic Log	Gross Gamma Log (1x500)	% CaCO3 / % Moist	Elev'n (Feet) / Depth (Feet)
	8" temporary casing set @ 437.2' TD @ 437.2'				ELEPHANT MOUNTAIN MEMBER			
440 / 230								440 / 230
450 / 220								450 / 220
460 / 210								460 / 210
470 / 200								470 / 200
480 / 190								480 / 190
490 / 180								490 / 180
500 / 170								500 / 170
510 / 160								510 / 160
520 / 150								520 / 150

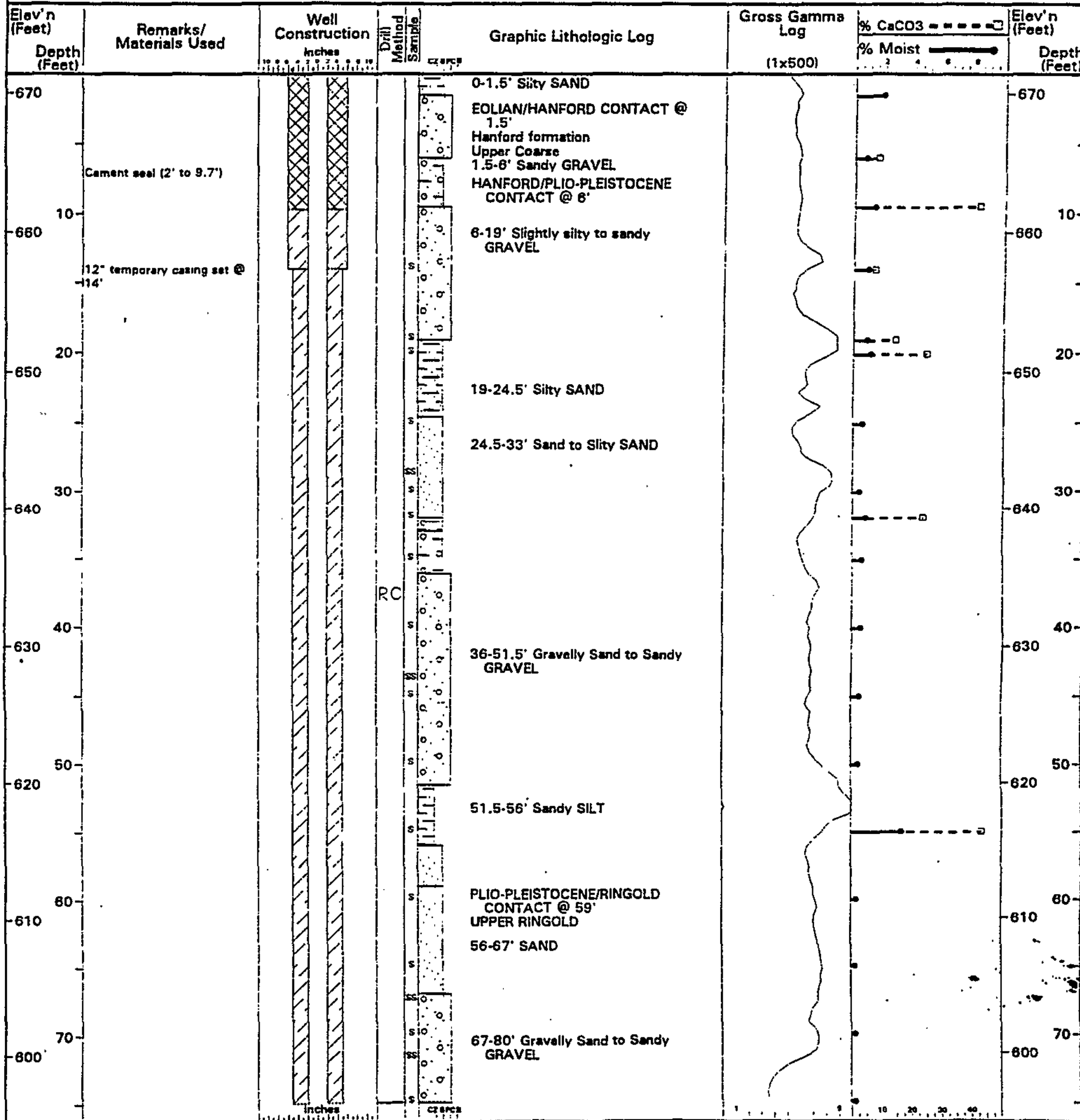
Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION	**Well No:** 699-48-77D Page 1 of 3
	Total Depth: 237.70 **Static Water Level:** 217.10
Date Started: 1-11-94 **Date Completed:** 1-31-94	**Surface Elevation:** 671.37 **Casing Elevation:** 673.87
Location: C018H	**Northing:** 138119.27 **Easting:** 566433.30
Prepared By: Templeton	**Hanford N:** 48096.14 **Hanford W:** 76952.88
Drilling Co: PC Exploration **Driller:** D KETTLE	**Drill Meth:** Reverse Circulation **Drill Equip:**

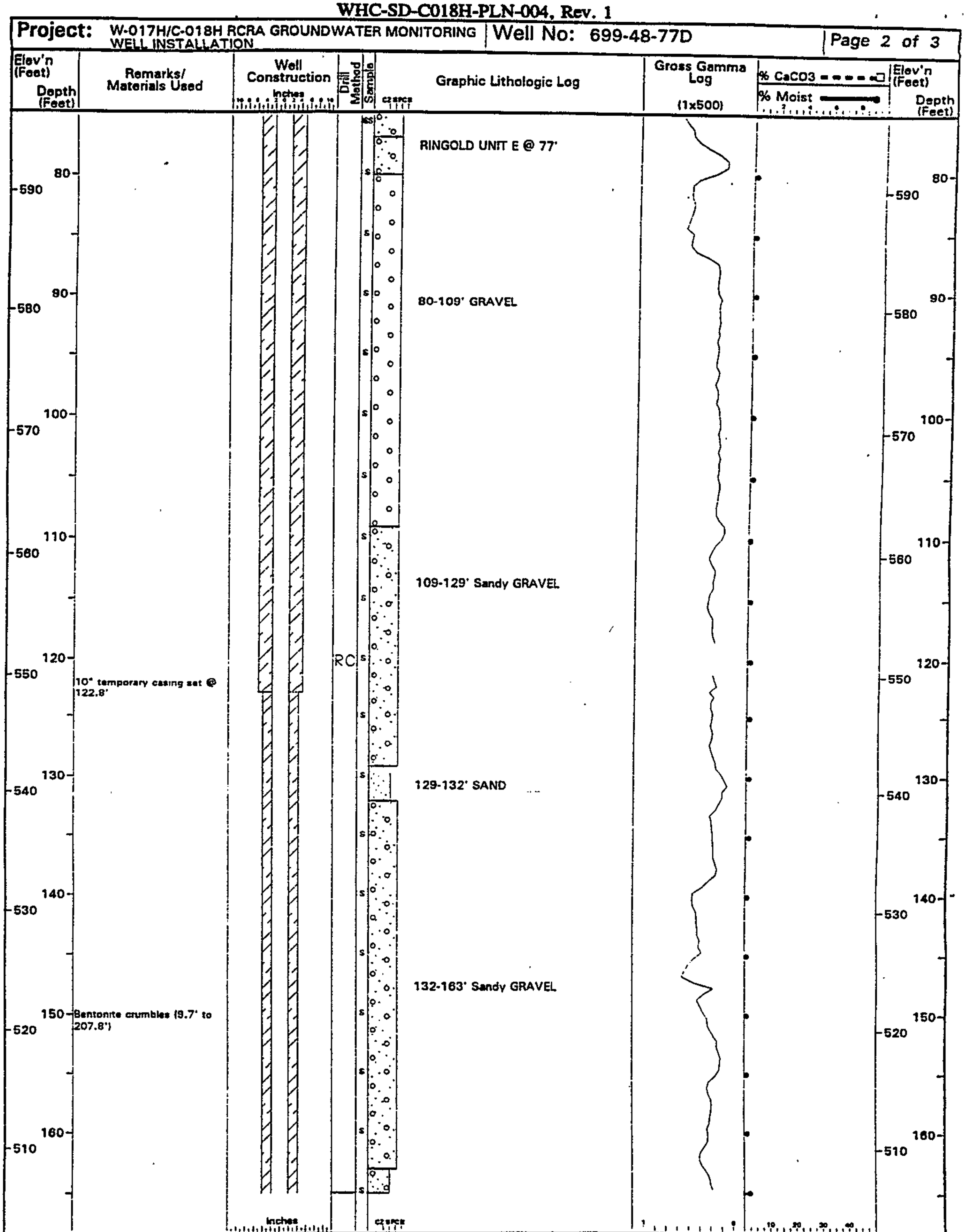
Screen: 4" 10 slot SS screen set at 214.7 to 234.7 ft bgs

Filter Pack: 20-40 Sand pack set at 211.6 to 236.1 ft bgs

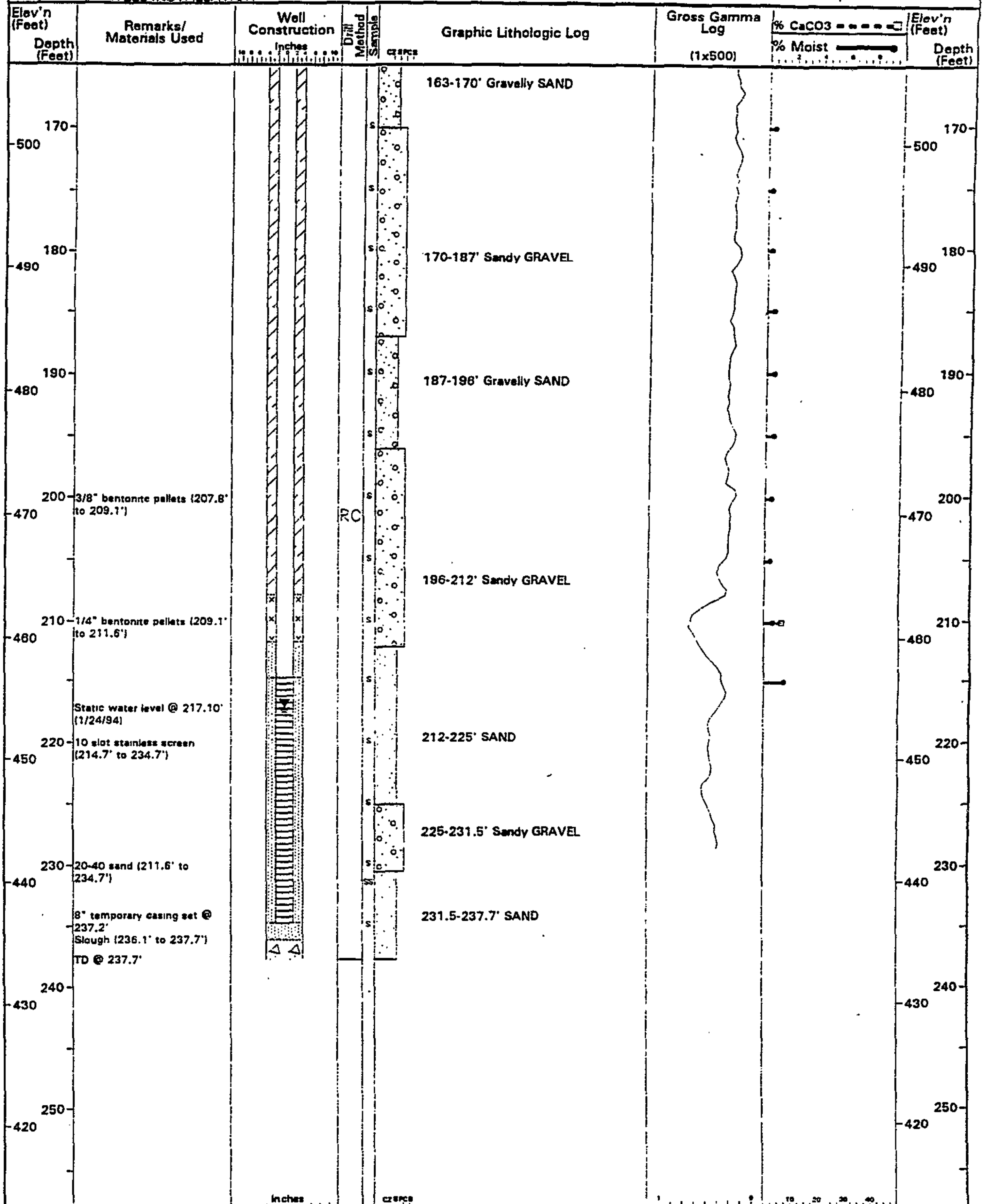
Permanent Casing: 4" 304 SS set from 3.0 ft above grade to 214.7 ft bgs

Comments:




Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION
Well No: 699-48-77D
Page 2 of 3
Elev'n (Feet) Depth (Feet)
Remarks/ Materials Used
Well Construction
Inches
Drill Method
Sample
Graphic Lithologic Log
Gross Gamma Log (1x500)
% CaCO3
% Moist
RINGOLD UNIT E @ 77'
80-109' GRAVEL
109-129' Sandy GRAVEL
10" temporary casing set @ 122.8'
RC
129-132' SAND
132-163' Sandy GRAVEL
Bentonite crumbles (9.7' to 207.8')
80
90
100
110
120
130
140
150
160
590
580
570
560
550
540
530
520
510

Project: W-017H/C-018H RCRA GROUNDWATER MONITORING WELL INSTALLATION	Well No: 699-48-77D	Page 3 of 3



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APPENDIX B

WATER-LEVEL MEASUREMENTS

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GeoDAT Report - 9/05/95

Groundwater Data Report

Well	Sample Date	Sample Number	Constituent Name	Result	Quali-fiers	Error	Units
699-48-77A	6/19/92	N/A	Hydraulic Head	-218.37			ft
	9/02/92	N/A	Hydraulic Head				ft
	11/02/92	N/A	Hydraulic Head	-218.95			ft
	2/22/93	N/A	Hydraulic Head	-219.16			ft
	5/17/93	N/A	Hydraulic Head	-219.20			ft
	9/02/93	N/A	Hydraulic Head	-219.21			ft
	10/15/93	N/A	Hydraulic Head	-219.42			ft
	1/17/94	N/A	Hydraulic Head	-219.77			ft
	4/15/94	N/A	Hydraulic Head	454.71			ft
	8/10/94	N/A	Hydraulic Head	454.56			ft
	10/31/94	N/A	Hydraulic Head	454.77			ft
	2/04/95	N/A	Hydraulic Head	454.15			ft
	4/17/95	N/A	Hydraulic Head	454.26			ft
	7/12/95	N/A	Hydraulic Head	453.19			ft
699-48-77C	5/23/94	N/A	Hydraulic Head	-222.20			ft
	8/10/94	N/A	Hydraulic Head	-220.32			ft
	10/31/94	N/A	Hydraulic Head	454.23			ft
	2/04/95	N/A	Hydraulic Head	453.53			ft
	4/17/95	N/A	Hydraulic Head	453.70			ft
	7/12/95	N/A	Hydraulic Head	452.61			ft
699-48-77D	5/23/94	N/A	Hydraulic Head	-220.19			ft
	8/10/94	N/A	Hydraulic Head	-220.12			ft
	10/31/94	N/A	Hydraulic Head	453.83			ft
	2/04/95	N/A	Hydraulic Head	453.34			ft

GeoDAT Report - 9/05/95

Groundwater Data Report

Well	Sample Date	Sample Number	Constituent Name	Result	Quali- fiers	Error	Units
699-48-77D	4/17/95	N/A	Hydraulic Head	453.33			ft
	7/12/95	N/A	Hydraulic Head	453.23			ft

APPENDIX C

GROUND WATER CHEMISTRY DATA

CONTENTS

This appendix is divided into four appendices which parallel Section 2.3.4. Appendix C.1 contains all of the data discussed in Section 2.3.4.1. Appendix C.2 contains all of the data discussed in Sections 2.3.4.2 and 2.3.4.3, with one exception; the data on specific conductance (SC) is in Appendix C.1. Appendix C.3 contains all of the data discussed in Section 2.3.4.4. Appendix C.4 contains all of the data discussed in Section 2.3.4.5.

The appendix lists the data by well, sample date, sample number, constituent name, result, qualifiers, error, and units. Error is calculated for specific laboratory/analytical conditions. Methods of error calculation will vary with the specific laboratory and constituent type. The qualifiers column contains qualifiers and flags assigned by the laboratory and WHC personnel, respectively. Qualifiers reflect conditions occurring in the laboratory relating to the analytical procedure. Flags serve a wider function of alerting the data user to the limitations of the reported value. Qualifiers and flags commonly are used in conjunction with one another. The qualifiers and flags used are as follows:

Laboratory qualifiers:

- B - Blank associated with analyte is contaminated
- D - Analyzed sample is diluted
- E - Concentration is not within the instrument calibration range
- J - Concentration is estimated
- L - Concentration is below the contractually required quantification limits but is above the Method Detection Limit
- U - Concentration is below the indicated value

Data flags:

- F - Suspect data currently under review
- H - Laboratory holding time exceeded
- G - Reviewed data that are considered valid
- P - Potential problem; see text associated with table
- Q - Result associated with suspect quality control data
- R - Reviewed data that have been rejected
- X - Other sample-specific flags described in sample data summary package
- Y - Reviewed data that continue to be suspect

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APPENDIX C.1

TURBIDITY AND FIELD PARAMETERS

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Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	19-Jun-92	B06W97	Specific conductance	316			umho/cm
699-48-77A	19-Jun-92	B06W97	pH	7.71			pH
699-48-77A	19-Jun-92	B06W97	Temperature, field	18.5			DegC
699-48-77A	02-Sep-92	B078V0	Specific conductance	296			umho/cm
699-48-77A	02-Sep-92	B078V0	pH	7.7			pH
699-48-77A	02-Sep-92	B078V0	Temperature, field	18.2			DegC
699-48-77A	02-Nov-92	B07LG2	Specific conductance	281			umho/cm
699-48-77A	02-Nov-92	B07LG2	pH	6.93			pH
699-48-77A	02-Nov-92	B07LG2	Temperature, field	17.5			DegC
699-48-77A	02-Nov-92	B07LG3	Specific conductance	280			umho/cm
699-48-77A	02-Nov-92	B07LG3	pH	6.97			pH
699-48-77A	02-Nov-92	B07LG3	Temperature, field	17.7			DegC
699-48-77A	02-Nov-92	B07LG4	Specific conductance	275			umho/cm
699-48-77A	02-Nov-92	B07LG4	pH	7.02			pH
699-48-77A	02-Nov-92	B07LG4	Temperature, field	17.8			DegC
699-48-77A	02-Nov-92	B07LG5	Specific conductance	279			umho/cm
699-48-77A	02-Nov-92	B07LG5	pH	7.07			pH
699-48-77A	02-Nov-92	B07LG5	Temperature, field	17.6			DegC
699-48-77A	22-Feb-93	B08702	Specific conductance	283			umho/cm
699-48-77A	22-Feb-93	B08702	pH	7.74			pH
699-48-77A	22-Feb-93	B08702	Temperature, field	16.1			DegC
699-48-77A	22-Feb-93	B08703	Specific conductance	283			umho/cm
699-48-77A	22-Feb-93	B08703	pH	7.74			pH
699-48-77A	22-Feb-93	B08704	Specific conductance	284			umho/cm
699-48-77A	22-Feb-93	B08704	pH	7.75			pH
699-48-77A	22-Feb-93	B08705	Specific conductance	284			umho/cm
699-48-77A	22-Feb-93	B08705	pH	7.75			pH
699-48-77A	17-May-93	B08JD2	Specific conductance	290			umho/cm
699-48-77A	17-May-93	B08JD2	pH	7.76			pH
699-48-77A	17-May-93	B08JD2	Temperature, field	17.8			DegC
699-48-77A	17-May-93	B08JD3	Specific conductance	287			umho/cm
699-48-77A	17-May-93	B08JD3	pH	7.76			pH
699-48-77A	17-May-93	B08JD3	Temperature, field	17.8			DegC
699-48-77A	17-May-93	B08JD4	Specific conductance	287			umho/cm
699-48-77A	17-May-93	B08JD4	pH	7.73			pH
699-48-77A	17-May-93	B08JD4	Temperature, field	17.8			DegC

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-May-93	B08JD5	Specific conductance	288			umho/cm
699-48-77A	17-May-93	B08JD5	pH	7.73			pH
699-48-77A	17-May-93	B08JD5	Temperature, field	17.7			DegC
699-48-77A	02-Sep-93	B090T6	Specific conductance	284			umho/cm
699-48-77A	02-Sep-93	B090T6	pH	7.74			pH
699-48-77A	02-Sep-93	B090T6	Temperature, field	17.6			DegC
699-48-77A	02-Sep-93	B090T7	Specific conductance	285			umho/cm
699-48-77A	02-Sep-93	B090T7	pH	7.72			pH
699-48-77A	02-Sep-93	B090T7	Temperature, field	17.6			DegC
699-48-77A	02-Sep-93	B090T8	Specific conductance	285			umho/cm
699-48-77A	02-Sep-93	B090T8	pH	7.72			pH
699-48-77A	02-Sep-93	B090T8	Temperature, field	17.5			DegC
699-48-77A	02-Sep-93	B090T9	Specific conductance	284			umho/cm
699-48-77A	02-Sep-93	B090T9	pH	7.72			pH
699-48-77A	02-Sep-93	B090T9	Temperature, field	17.5			DegC
699-48-77A	15-Oct-93	B09B39	Specific conductance	282			umho/cm
699-48-77A	15-Oct-93	B09B39	pH	7.97			pH
699-48-77A	15-Oct-93	B09B39	Temperature, field	17.2			DegC
699-48-77A	15-Oct-93	B09B40	Specific conductance	282			umho/cm
699-48-77A	15-Oct-93	B09B40	pH	7.95			pH
699-48-77A	15-Oct-93	B09B41	Specific conductance	281			umho/cm
699-48-77A	15-Oct-93	B09B41	pH	7.94			pH
699-48-77A	15-Oct-93	B09B42	Specific conductance	282			umho/cm
699-48-77A	15-Oct-93	B09B42	pH	7.94			pH
699-48-77A	17-Jan-94	B09Q40	Specific conductance	289			umho/cm
699-48-77A	17-Jan-94	B09Q40	pH	7.83			pH
699-48-77A	17-Jan-94	B09Q40	Temperature, field	17.1			DegC
699-48-77A	17-Jan-94	B09Q41	Specific conductance	289			umho/cm
699-48-77A	17-Jan-94	B09Q41	pH	7.8			pH
699-48-77A	17-Jan-94	B09Q42	Specific conductance	288			umho/cm
699-48-77A	17-Jan-94	B09Q42	pH	7.8			pH
699-48-77A	17-Jan-94	B09Q43	Specific conductance	289			umho/cm
699-48-77A	17-Jan-94	B09Q43	pH	7.79			pH
699-48-77A	15-Apr-94	B0BRD9	Specific conductance	272			umho/cm
699-48-77A	15-Apr-94	B0BRD9	pH	7.73			pH
699-48-77A	15-Apr-94	B0BRD9	Temperature, field	18			DegC

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	15-Apr-94	B0BRF0	Specific conductance	271			umho/cm
699-48-77A	15-Apr-94	B0BRF0	pH	7.73			pH
699-48-77A	15-Apr-94	B0BRF1	Specific conductance	268			umho/cm
699-48-77A	15-Apr-94	B0BRF1	pH	7.71			pH
699-48-77A	15-Apr-94	B0BRF2	Specific conductance	271			umho/cm
699-48-77A	15-Apr-94	B0BRF2	pH	7.77			pH
699-48-77A	10-Aug-94	B0C754	Specific conductance	286			umho/cm
699-48-77A	10-Aug-94	B0C754	pH	7.77			pH
699-48-77A	10-Aug-94	B0C754	Temperature, field	17.8			DegC
699-48-77A	10-Aug-94	B0C755	Specific conductance	284			umho/cm
699-48-77A	10-Aug-94	B0C755	pH	7.74			pH
699-48-77A	10-Aug-94	B0C756	Specific conductance	283			umho/cm
699-48-77A	10-Aug-94	B0C756	pH	7.71			pH
699-48-77A	10-Aug-94	B0C757	Specific conductance	285			umho/cm
699-48-77A	10-Aug-94	B0C757	pH	7.72			pH
699-48-77A	31-Oct-94	B0D5N5	Specific conductance	292			umho/cm
699-48-77A	31-Oct-94	B0D5N5	pH	7.9			pH
699-48-77A	31-Oct-94	B0D5N5	Temperature, field	16.8			DegC
699-48-77A	31-Oct-94	B0D5N7	Specific conductance	292			umho/cm
699-48-77A	31-Oct-94	B0D5N7	pH	7.9			pH
699-48-77A	31-Oct-94	B0D5N7	Temperature, field	16.8			DegC
699-48-77A	04-Feb-95	B0DP76	Specific conductance	285			umho/cm
699-48-77A	04-Feb-95	B0DP76	pH	8.02			pH
699-48-77A	04-Feb-95	B0DP76	Temperature, field	16.6			DegC
699-48-77A	04-Feb-95	B0DP76	Turbidity	1.66			NTU
699-48-77A	04-Feb-95	B0DP77	Specific conductance	285			umho/cm
699-48-77A	04-Feb-95	B0DP77	pH	8.02			pH
699-48-77A	04-Feb-95	B0DP77	Temperature, field	16.5			DegC
699-48-77A	04-Feb-95	B0F805	Specific conductance	285			umho/cm
699-48-77A	04-Feb-95	B0F805	pH	8.02			pH
699-48-77A	04-Feb-95	B0F805	Temperature, field	16.5			DegC
699-48-77A	04-Feb-95	B0F806	Specific conductance	285			umho/cm
699-48-77A	04-Feb-95	B0F806	pH	8.01			pH
699-48-77A	04-Feb-95	B0F806	Temperature, field	16.6			DegC
699-48-77A	17-Apr-95	B0FB15	Alkalinity	90			ppm
699-48-77A	17-Apr-95	B0FB15	Specific conductance	280			umho/cm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-Apr-95	B0FB15	pH	7.62			pH
699-48-77A	17-Apr-95	B0FB15	Temperature, field	15.9			DegC
699-48-77A	17-Apr-95	B0FB15	Turbidity	0.8			NTU
699-48-77A	17-Apr-95	B0FB16	Alkalinity	90			ppm
699-48-77A	17-Apr-95	B0FB16	Specific conductance	280			umho/cm
699-48-77A	17-Apr-95	B0FB16	pH	7.62			pH
699-48-77A	17-Apr-95	B0FB16	Temperature, field	15.9			DegC
699-48-77A	17-Apr-95	B0FB16	Turbidity	0.84			NTU
699-48-77A	17-Apr-95	B0FB17	Alkalinity	83			ppm
699-48-77A	17-Apr-95	B0FB17	Specific conductance	279			umho/cm
699-48-77A	17-Apr-95	B0FB17	pH	7.62			pH
699-48-77A	17-Apr-95	B0FB17	Temperature, field	15.9			DegC
699-48-77A	17-Apr-95	B0FB17	Turbidity	1.02			NTU
699-48-77A	17-Apr-95	B0FB18	Alkalinity	84			ppm
699-48-77A	17-Apr-95	B0FB18	Specific conductance	279			umho/cm
699-48-77A	17-Apr-95	B0FB18	pH	7.62			pH
699-48-77A	17-Apr-95	B0FB18	Temperature, field	15.9			DegC
699-48-77A	17-Apr-95	B0FB18	Turbidity	1.24			NTU
699-48-77A	12-Jul-95	B0G4V6	Alkalinity	103			ppm
699-48-77A	12-Jul-95	B0G4V6	Specific conductance	330			umho/cm
699-48-77A	12-Jul-95	B0G4V6	pH	7.97			pH
699-48-77A	12-Jul-95	B0G4V6	Temperature, field	17.6			DegC
699-48-77A	12-Jul-95	B0G4V6	Turbidity	1.79			NTU
699-48-77A	12-Jul-95	B0G4V7	Alkalinity	103			ppm
699-48-77A	12-Jul-95	B0G4V7	Specific conductance	303			umho/cm
699-48-77A	12-Jul-95	B0G4V7	pH	7.95			pH
699-48-77A	12-Jul-95	B0G4V7	Temperature, field	17.6			DegC
699-48-77A	12-Jul-95	B0G4V8	Alkalinity	103			ppm
699-48-77A	12-Jul-95	B0G4V8	Specific conductance	282			umho/cm
699-48-77A	12-Jul-95	B0G4V8	pH	7.93			pH
699-48-77A	12-Jul-95	B0G4V8	Temperature, field	17.4			DegC
699-48-77A	12-Jul-95	B0G4V9	Alkalinity	104			ppm
699-48-77A	12-Jul-95	B0G4V9	Specific conductance	288			umho/cm
699-48-77A	12-Jul-95	B0G4V9	pH	7.96			pH
699-48-77A	12-Jul-95	B0G4V9	Temperature, field	17.4			DegC
699-48-77A	27-Jul-95	B0FZ89	Specific conductance	286			umho/cm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	27-Jul-95	B0FZ89	pH	7.77			pH
699-48-77A	27-Jul-95	B0FZ89	Temperature, field	17.5			DegC
699-48-77C	23-May-94	B0BTY4	Specific conductance	284			umho/cm
699-48-77C	23-May-94	B0BTY4	pH	7.73			pH
699-48-77C	23-May-94	B0BTY4	Temperature, field	18.5			DegC
699-48-77C	23-May-94	B0BTY5	Specific conductance	283			umho/cm
699-48-77C	23-May-94	B0BTY5	pH	7.71			pH
699-48-77C	23-May-94	B0BTY5	Temperature, field	18.5			DegC
699-48-77C	23-May-94	B0BTY6	Specific conductance	283			umho/cm
699-48-77C	23-May-94	B0BTY6	pH	7.74			pH
699-48-77C	23-May-94	B0BTY6	Temperature, field	18.5			DegC
699-48-77C	23-May-94	B0BTY7	Specific conductance	284			umho/cm
699-48-77C	23-May-94	B0BTY7	pH	7.71			pH
699-48-77C	23-May-94	B0BTY7	Temperature, field	18.5			DegC
699-48-77C	10-Aug-94	B0C7N8	Specific conductance	290			umho/cm
699-48-77C	10-Aug-94	B0C7N8	pH	7.77			pH
699-48-77C	10-Aug-94	B0C7N8	Temperature, field	18			DegC
699-48-77C	10-Aug-94	B0C7N9	Specific conductance	290			umho/cm
699-48-77C	10-Aug-94	B0C7N9	pH	7.73			pH
699-48-77C	10-Aug-94	B0C7P0	Specific conductance	289			umho/cm
699-48-77C	10-Aug-94	B0C7P0	pH	7.72			pH
699-48-77C	10-Aug-94	B0C7P1	Specific conductance	289			umho/cm
699-48-77C	10-Aug-94	B0C7P1	pH	7.72			pH
699-48-77C	31-Oct-94	B0D5N9	Specific conductance	293			umho/cm
699-48-77C	31-Oct-94	B0D5N9	pH	7.92			pH
699-48-77C	31-Oct-94	B0D5N9	Temperature, field	17.1			DegC
699-48-77C	04-Feb-95	B0DP79	Specific conductance	294			umho/cm
699-48-77C	04-Feb-95	B0DP79	pH	7.9			pH
699-48-77C	04-Feb-95	B0DP79	Temperature, field	16.8			DegC
699-48-77C	04-Feb-95	B0DP79	Turbidity	1.81			NTU
699-48-77C	04-Feb-95	B0DP80	Specific conductance	294			umho/cm
699-48-77C	04-Feb-95	B0DP80	pH	7.91			pH
699-48-77C	04-Feb-95	B0DP80	Temperature, field	16.8			DegC
699-48-77C	04-Feb-95	B0F803	Specific conductance	294			umho/cm
699-48-77C	04-Feb-95	B0F803	pH	7.92			pH
699-48-77C	04-Feb-95	B0F803	Temperature, field	16.8			DegC

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	04-Feb-95	B0F804	Specific conductance	294			umho/cm
699-48-77C	04-Feb-95	B0F804	pH	7.89			pH
699-48-77C	04-Feb-95	B0F804	Temperature, field	16.2			DegC
699-48-77C	17-Apr-95	B0FB20	Alkalinity	87			ppm
699-48-77C	17-Apr-95	B0FB20	Specific conductance	283			umho/cm
699-48-77C	17-Apr-95	B0FB20	pH	7.56			pH
699-48-77C	17-Apr-95	B0FB20	Temperature, field	16.8			DegC
699-48-77C	17-Apr-95	B0FB20	Turbidity	0.95			NTU
699-48-77C	17-Apr-95	B0FB21	Alkalinity	85			ppm
699-48-77C	17-Apr-95	B0FB21	Specific conductance	282			umho/cm
699-48-77C	17-Apr-95	B0FB21	pH	7.56			pH
699-48-77C	17-Apr-95	B0FB21	Temperature, field	16.8			DegC
699-48-77C	17-Apr-95	B0FB21	Turbidity	1.12			NTU
699-48-77C	17-Apr-95	B0FB22	Alkalinity	90			ppm
699-48-77C	17-Apr-95	B0FB22	Specific conductance	281			umho/cm
699-48-77C	17-Apr-95	B0FB22	pH	7.56			pH
699-48-77C	17-Apr-95	B0FB22	Temperature, field	16.8			DegC
699-48-77C	17-Apr-95	B0FB22	Turbidity	1.24			NTU
699-48-77C	17-Apr-95	B0FB23	Alkalinity	82			ppm
699-48-77C	17-Apr-95	B0FB23	Specific conductance	281			umho/cm
699-48-77C	17-Apr-95	B0FB23	pH	7.56			pH
699-48-77C	17-Apr-95	B0FB23	Temperature, field	16.8			DegC
699-48-77C	17-Apr-95	B0FB23	Turbidity	2.06			NTU
699-48-77C	12-Jul-95	B0G4W6	Alkalinity	103			ppm
699-48-77C	12-Jul-95	B0G4W6	Specific conductance	291			umho/cm
699-48-77C	12-Jul-95	B0G4W6	pH	7.94			pH
699-48-77C	12-Jul-95	B0G4W6	Temperature, field	18.5			DegC
699-48-77C	12-Jul-95	B0G4W6	Turbidity	0.91			NTU
699-48-77C	12-Jul-95	B0G4W7	Alkalinity	102			ppm
699-48-77C	12-Jul-95	B0G4W7	Specific conductance	289			umho/cm
699-48-77C	12-Jul-95	B0G4W7	pH	7.94			pH
699-48-77C	12-Jul-95	B0G4W7	Temperature, field	18.2			DegC
699-48-77C	12-Jul-95	B0G4W8	Alkalinity	102			ppm
699-48-77C	12-Jul-95	B0G4W8	Specific conductance	291			umho/cm
699-48-77C	12-Jul-95	B0G4W8	pH	7.9			pH
699-48-77C	12-Jul-95	B0G4W8	Temperature, field	18.1			DegC

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	12-Jul-95	B0G4W9	Alkalinity	106			ppm
699-48-77C	12-Jul-95	B0G4W9	Specific conductance	277			umho/cm
699-48-77C	12-Jul-95	B0G4W9	pH	7.93			pH
699-48-77C	12-Jul-95	B0G4W9	Temperature, field	18			DegC
699-48-77D	23-May-94	B0BTY9	Specific conductance	283			umho/cm
699-48-77D	23-May-94	B0BTY9	pH	7.69			pH
699-48-77D	23-May-94	B0BTY9	Temperature, field	18.7			DegC
699-48-77D	23-May-94	B0BTZ0	Specific conductance	291			umho/cm
699-48-77D	23-May-94	B0BTZ0	pH	7.69			pH
699-48-77D	23-May-94	B0BTZ0	Temperature, field	18.5			DegC
699-48-77D	23-May-94	B0BTZ1	Specific conductance	291			umho/cm
699-48-77D	23-May-94	B0BTZ1	pH	7.68			pH
699-48-77D	23-May-94	B0BTZ1	Temperature, field	18.5			DegC
699-48-77D	23-May-94	B0BTZ2	Specific conductance	290			umho/cm
699-48-77D	23-May-94	B0BTZ2	pH	7.67			pH
699-48-77D	23-May-94	B0BTZ2	Temperature, field	18.5			DegC
699-48-77D	10-Aug-94	B0C7P3	Specific conductance	306			umho/cm
699-48-77D	10-Aug-94	B0C7P3	pH	7.87			pH
699-48-77D	10-Aug-94	B0C7P3	Temperature, field	17.8			DegC
699-48-77D	10-Aug-94	B0C7P4	Specific conductance	299			umho/cm
699-48-77D	10-Aug-94	B0C7P4	pH	7.83			pH
699-48-77D	10-Aug-94	B0C7P5	Specific conductance	300			umho/cm
699-48-77D	10-Aug-94	B0C7P5	pH	7.81			pH
699-48-77D	10-Aug-94	B0C7P6	Specific conductance	300			umho/cm
699-48-77D	10-Aug-94	B0C7P6	pH	7.8			pH
699-48-77D	31-Oct-94	B0D5P1	Specific conductance	301			umho/cm
699-48-77D	31-Oct-94	B0D5P1	pH	7.96			pH
699-48-77D	31-Oct-94	B0D5P1	Temperature, field	17			DegC
699-48-77D	04-Feb-95	B0DP82	Specific conductance	301			umho/cm
699-48-77D	04-Feb-95	B0DP82	pH	8.29			pH
699-48-77D	04-Feb-95	B0DP82	Temperature, field	17			DegC
699-48-77D	04-Feb-95	B0DP82	Turbidity	1.79			NTU
699-48-77D	04-Feb-95	B0DP83	Specific conductance	301			umho/cm
699-48-77D	04-Feb-95	B0DP83	pH	8.27			pH
699-48-77D	04-Feb-95	B0DP83	Temperature, field	17			DegC
699-48-77D	04-Feb-95	B0F807	Specific conductance	301			umho/cm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	04-Feb-95	B0F807	pH	8.25			pH
699-48-77D	04-Feb-95	B0F807	Temperature, field	17			DegC
699-48-77D	04-Feb-95	B0F808	Specific conductance	301			umho/cm
699-48-77D	04-Feb-95	B0F808	pH	8.24			pH
699-48-77D	04-Feb-95	B0F808	Temperature, field	17.1			DegC
699-48-77D	17-Apr-95	B0FB30	Alkalinity	94			ppm
699-48-77D	17-Apr-95	B0FB30	Specific conductance	294			umho/cm
699-48-77D	17-Apr-95	B0FB30	pH	8.51			pH
699-48-77D	17-Apr-95	B0FB30	Temperature, field	16.9			DegC
699-48-77D	17-Apr-95	B0FB30	Turbidity	1.11			NTU
699-48-77D	17-Apr-95	B0FB31	Alkalinity	87			ppm
699-48-77D	17-Apr-95	B0FB31	Specific conductance	293			umho/cm
699-48-77D	17-Apr-95	B0FB31	pH	8.51			pH
699-48-77D	17-Apr-95	B0FB31	Temperature, field	16.9			DegC
699-48-77D	17-Apr-95	B0FB31	Turbidity	0.94			NTU
699-48-77D	17-Apr-95	B0FB32	Alkalinity	87			ppm
699-48-77D	17-Apr-95	B0FB32	Specific conductance	292			umho/cm
699-48-77D	17-Apr-95	B0FB32	pH	8.5			pH
699-48-77D	17-Apr-95	B0FB32	Temperature, field	16.9			DegC
699-48-77D	17-Apr-95	B0FB32	Turbidity	0.94			NTU
699-48-77D	17-Apr-95	B0FB33	Alkalinity	90			ppm
699-48-77D	17-Apr-95	B0FB33	Specific conductance	292			umho/cm
699-48-77D	17-Apr-95	B0FB33	pH	8.49			pH
699-48-77D	17-Apr-95	B0FB33	Temperature, field	16.9			DegC
699-48-77D	17-Apr-95	B0FB33	Turbidity	0.98			NTU
699-48-77D	12-Jul-95	B0G4X1	Alkalinity	103			ppm
699-48-77D	12-Jul-95	B0G4X1	Specific conductance	303			umho/cm
699-48-77D	12-Jul-95	B0G4X1	pH	8.22			pH
699-48-77D	12-Jul-95	B0G4X1	Temperature, field	17.9			DegC
699-48-77D	12-Jul-95	B0G4X1	Turbidity	1.18			NTU
699-48-77D	12-Jul-95	B0G4X2	Alkalinity	103			ppm
699-48-77D	12-Jul-95	B0G4X2	Specific conductance	303			umho/cm
699-48-77D	12-Jul-95	B0G4X2	pH	8.23			pH
699-48-77D	12-Jul-95	B0G4X2	Temperature, field	17.7			DegC
699-48-77D	12-Jul-95	B0G4X3	Alkalinity	103			ppm
699-48-77D	12-Jul-95	B0G4X3	Specific conductance	303			umho/cm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	12-Jul-95	B0G4X3	pH	8.23			pH
699-48-77D	12-Jul-95	B0G4X3	Temperature, field	17.6			DegC
699-48-77D	12-Jul-95	B0G4X4	Alkalinity	103			ppm
699-48-77D	12-Jul-95	B0G4X4	Specific conductance	302			umho/cm
699-48-77D	12-Jul-95	B0G4X4	pH	8.22			pH
699-48-77D	12-Jul-95	B0G4X4	Temperature, field	17.6			DegC

APPENDIX C.2

CATIONS, ANIONS, METALS, AND CYANIDE

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Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	19-Jun-92	B06W97	Chloride	6600		2220	ppb
699-48-77A	19-Jun-92	B06W97	Phosphate	0	U		
699-48-77A	19-Jun-92	B06W97	Nitrate	28000		15800	ppb
699-48-77A	19-Jun-92	B06W97	Nitrite	0	U		
699-48-77A	19-Jun-92	B06W97	Sulfate	25000		24100	ppb
699-48-77A	19-Jun-92	B06W97	Fluoride	400		84.4	ppb
699-48-77A	19-Jun-92	B06W97	Bromide	0	U		
699-48-77A	19-Jun-92	B06W97	Hydrazine	0	U		
699-48-77A	19-Jun-92	B06W97	Cyanide	0	U		
699-48-77A	19-Jun-92	B06W97	Iron	560		482	ppb
699-48-77A	19-Jun-92	B06W97	Lead	0	U		
699-48-77A	19-Jun-92	B06W97	Magnesium	12000			ppb
699-48-77A	19-Jun-92	B06W97	Manganese	27		4.12	ppb
699-48-77A	19-Jun-92	B06W97	Mercury	0	U		
699-48-77A	19-Jun-92	B06W97	Nickel	0	U		
699-48-77A	19-Jun-92	B06W97	Potassium	3700			ppb
699-48-77A	19-Jun-92	B06W97	Silver	0	U		
699-48-77A	19-Jun-92	B06W97	Sodium	17000			ppb
699-48-77A	19-Jun-92	B06W97	Tin	0	U		
699-48-77A	19-Jun-92	B06W97	Antimony	0	U		
699-48-77A	19-Jun-92	B06W97	Arsenic	0	U		
699-48-77A	19-Jun-92	B06W97	Barium	74		10.2	ppb
699-48-77A	19-Jun-92	B06W97	Beryllium	0	U		
699-48-77A	19-Jun-92	B06W97	Cadmium	0	U		
699-48-77A	19-Jun-92	B06W97	Chromium	0	U		
699-48-77A	19-Jun-92	B06W97	Cobalt	0	U		
699-48-77A	19-Jun-92	B06W97	Copper	0	U		
699-48-77A	19-Jun-92	B06W97	Vanadium	0	U		
699-48-77A	19-Jun-92	B06W97	Zinc	87		11.1	ppb
699-48-77A	19-Jun-92	B06W97	Calcium	33000			ppb
699-48-77A	19-Jun-92	B06W97	Selenium	0	U		
699-48-77A	19-Jun-92	B06W97	Coliforms	65			Col/dL
699-48-77A	19-Jun-92	B06W98	Iron, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Lead, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Magnesium, filtered	12000			ppb
699-48-77A	19-Jun-92	B06W98	Manganese, filtered	0	U		

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	19-Jun-92	B06W98	Mercury, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Nickel, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Potassium, filtered	3300			ppb
699-48-77A	19-Jun-92	B06W98	Silver, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Sodium, filtered	15000			ppb
699-48-77A	19-Jun-92	B06W98	Tin, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Antimony, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Arsenic, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Barium, filtered	67		9.25	ppb
699-48-77A	19-Jun-92	B06W98	Beryllium, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Cadmium, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Chromium, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Cobalt, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Copper, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Vanadium, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Zinc, filtered	0	U		
699-48-77A	19-Jun-92	B06W98	Calcium, filtered	31000			ppb
699-48-77A	19-Jun-92	B06W98	Selenium, filtered	0	U		
699-48-77A	02-Sep-92	B078V0	Chloride	4600		1550	ppb
699-48-77A	02-Sep-92	B078V0	Phosphate	0	U		
699-48-77A	02-Sep-92	B078V0	Nitrate	20000		11300	ppb
699-48-77A	02-Sep-92	B078V0	Nitrite	0	U		
699-48-77A	02-Sep-92	B078V0	Sulfate	24000		23200	ppb
699-48-77A	02-Sep-92	B078V0	Fluoride	300		63.3	ppb
699-48-77A	02-Sep-92	B078V0	Bromide	0	U		
699-48-77A	02-Sep-92	B078V0	Hydrazine	0	U		
699-48-77A	02-Sep-92	B078V0	Cyanide	0	U		
699-48-77A	02-Sep-92	B078V0	Coliforms	2			Col/dL
699-48-77A	02-Nov-92	B07LG2	Hydrazine	30	U		ppb
699-48-77A	02-Nov-92	B07LG2	Cyanide	20	U		ppb
699-48-77A	02-Nov-92	B07LG2	Iron	350		301	ppb
699-48-77A	02-Nov-92	B07LG2	Lead	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Magnesium	12000			ppb
699-48-77A	02-Nov-92	B07LG2	Manganese	10		1.53	ppb
699-48-77A	02-Nov-92	B07LG2	Nickel	40		8.4	ppb
699-48-77A	02-Nov-92	B07LG2	Potassium	3600			ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	02-Nov-92	B07LG2	Silver	20	U		ppb
699-48-77A	02-Nov-92	B07LG2	Sodium	11000			ppb
699-48-77A	02-Nov-92	B07LG2	Tin	100	U		ppb
699-48-77A	02-Nov-92	B07LG2	Antimony	200	U		ppb
699-48-77A	02-Nov-92	B07LG2	Arsenic	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Barium	70		9.66	ppb
699-48-77A	02-Nov-92	B07LG2	Beryllium	3	U		ppb
699-48-77A	02-Nov-92	B07LG2	Cadmium	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Chromium	50		29.9	ppb
699-48-77A	02-Nov-92	B07LG2	Cobalt	20	U		ppb
699-48-77A	02-Nov-92	B07LG2	Copper	20	U		ppb
699-48-77A	02-Nov-92	B07LG2	Vanadium	30	U		ppb
699-48-77A	02-Nov-92	B07LG2	Zinc	30		3.83	ppb
699-48-77A	02-Nov-92	B07LG2	Calcium	31000			ppb
699-48-77A	02-Nov-92	B07LG2	Selenium	10	U		ppb
699-48-77A	02-Nov-92	B07LG6	Iron, filtered	40		34.4	ppb
699-48-77A	02-Nov-92	B07LG6	Lead, filtered	5	U		ppb
699-48-77A	02-Nov-92	B07LG6	Magnesium, filtered	12000			ppb
699-48-77A	02-Nov-92	B07LG6	Manganese, filtered	10	U		ppb
699-48-77A	02-Nov-92	B07LG6	Nickel, filtered	30	U		ppb
699-48-77A	02-Nov-92	B07LG6	Potassium, filtered	3600			ppb
699-48-77A	02-Nov-92	B07LG6	Silver, filtered	20	U		ppb
699-48-77A	02-Nov-92	B07LG6	Sodium, filtered	13000			ppb
699-48-77A	02-Nov-92	B07LG6	Tin, filtered	100	U		ppb
699-48-77A	02-Nov-92	B07LG6	Antimony, filtered	200	U		ppb
699-48-77A	02-Nov-92	B07LG6	Arsenic, filtered	5	U		ppb
699-48-77A	02-Nov-92	B07LG6	Barium, filtered	70		9.66	ppb
699-48-77A	02-Nov-92	B07LG6	Beryllium, filtered	3	U		ppb
699-48-77A	02-Nov-92	B07LG6	Cadmium, filtered	10	U		ppb
699-48-77A	02-Nov-92	B07LG6	Chromium, filtered	20	U		ppb
699-48-77A	02-Nov-92	B07LG6	Cobalt, filtered	20	U		ppb
699-48-77A	02-Nov-92	B07LG6	Copper, filtered	20	U		ppb
699-48-77A	02-Nov-92	B07LG6	Vanadium, filtered	30	U		ppb
699-48-77A	02-Nov-92	B07LG6	Zinc, filtered	10	U		ppb
699-48-77A	02-Nov-92	B07LG6	Calcium, filtered	32000			ppb
699-48-77A	02-Nov-92	B07LG6	Selenium, filtered	10	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	22-Feb-93	B08702	Chloride	3700		1250	ppb
699-48-77A	22-Feb-93	B08702	Phosphate	400	U		ppb
699-48-77A	22-Feb-93	B08702	Nitrate	16000		9000	ppb
699-48-77A	22-Feb-93	B08702	Nitrite	200	U		ppb
699-48-77A	22-Feb-93	B08702	Sulfate	22000		21200	ppb
699-48-77A	22-Feb-93	B08702	Fluoride	500		105	ppb
699-48-77A	22-Feb-93	B08702	Bromide	500	U		ppb
699-48-77A	22-Feb-93	B08702	Hydrazine	30	U		ppb
699-48-77A	22-Feb-93	B08702	Cyanide	20	U		ppb
699-48-77A	22-Feb-93	B08702	Iron	160		138	ppb
699-48-77A	22-Feb-93	B08702	Lead	5	U		ppb
699-48-77A	22-Feb-93	B08702	Magnesium	12000			ppb
699-48-77A	22-Feb-93	B08702	Manganese	10		1.53	ppb
699-48-77A	22-Feb-93	B08702	Mercury	0.2	U		ppb
699-48-77A	22-Feb-93	B08702	Nickel	30		6.3	ppb
699-48-77A	22-Feb-93	B08702	Potassium	3500			ppb
699-48-77A	22-Feb-93	B08702	Silver	20	U		ppb
699-48-77A	22-Feb-93	B08702	Sodium	11000			ppb
699-48-77A	22-Feb-93	B08702	Tin	100	U		ppb
699-48-77A	22-Feb-93	B08702	Antimony	200	U		ppb
699-48-77A	22-Feb-93	B08702	Arsenic	5	U		ppb
699-48-77A	22-Feb-93	B08702	Barium	70		9.66	ppb
699-48-77A	22-Feb-93	B08702	Beryllium	3	U		ppb
699-48-77A	22-Feb-93	B08702	Cadmium	10	U		ppb
699-48-77A	22-Feb-93	B08702	Chromium	30		17.9	ppb
699-48-77A	22-Feb-93	B08702	Cobalt	20	U		ppb
699-48-77A	22-Feb-93	B08702	Copper	20	U		ppb
699-48-77A	22-Feb-93	B08702	Vanadium	30	U		ppb
699-48-77A	22-Feb-93	B08702	Zinc	30		3.83	ppb
699-48-77A	22-Feb-93	B08702	Calcium	32000			ppb
699-48-77A	22-Feb-93	B08702	Selenium	10	U		ppb
699-48-77A	22-Feb-93	B08702	Coliforms	1	U		Col/dL
699-48-77A	22-Feb-93	B08706	Iron, filtered	20	U		ppb
699-48-77A	22-Feb-93	B08706	Lead, filtered	5	U		ppb
699-48-77A	22-Feb-93	B08706	Magnesium, filtered	12000			ppb
699-48-77A	22-Feb-93	B08706	Manganese, filtered	10	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	22-Feb-93	B08706	Mercury, filtered	0.2	U		ppb
699-48-77A	22-Feb-93	B08706	Nickel, filtered	30	U		ppb
699-48-77A	22-Feb-93	B08706	Potassium, filtered	4300			ppb
699-48-77A	22-Feb-93	B08706	Silver, filtered	20	U		ppb
699-48-77A	22-Feb-93	B08706	Sodium, filtered	11000			ppb
699-48-77A	22-Feb-93	B08706	Tin, filtered	100	U		ppb
699-48-77A	22-Feb-93	B08706	Antimony, filtered	200	U		ppb
699-48-77A	22-Feb-93	B08706	Arsenic, filtered	5	U		ppb
699-48-77A	22-Feb-93	B08706	Barium, filtered	70		9.66	ppb
699-48-77A	22-Feb-93	B08706	Beryllium, filtered	3	U		ppb
699-48-77A	22-Feb-93	B08706	Cadmium, filtered	10	U		ppb
699-48-77A	22-Feb-93	B08706	Chromium, filtered	20	U		ppb
699-48-77A	22-Feb-93	B08706	Cobalt, filtered	20	U		ppb
699-48-77A	22-Feb-93	B08706	Copper, filtered	20	U		ppb
699-48-77A	22-Feb-93	B08706	Vanadium, filtered	30	U		ppb
699-48-77A	22-Feb-93	B08706	Zinc, filtered	10	U		ppb
699-48-77A	22-Feb-93	B08706	Calcium, filtered	30000			ppb
699-48-77A	22-Feb-93	B08706	Selenium, filtered	10	U		ppb
699-48-77A	17-May-93	B08JD2	Chloride	5300		878	ppb
699-48-77A	17-May-93	B08JD2	Phosphate	400	U		ppb
699-48-77A	17-May-93	B08JD2	Nitrate	21000		1820	ppb
699-48-77A	17-May-93	B08JD2	Nitrite	200	U		ppb
699-48-77A	17-May-93	B08JD2	Sulfate	23000		1120	ppb
699-48-77A	17-May-93	B08JD2	Fluoride	500		32.7	ppb
699-48-77A	17-May-93	B08JD2	Bromide	70	L	3.57	ppb
699-48-77A	17-May-93	B08JD2	Hydrazine	30	U		ppb
699-48-77A	17-May-93	B08JD2	Cyanide	20	U		ppb
699-48-77A	17-May-93	B08JD2	Aluminum	130	L		ppb
699-48-77A	17-May-93	B08JD2	Iron	920		411	ppb
699-48-77A	17-May-93	B08JD2	Lead	5	U		ppb
699-48-77A	17-May-93	B08JD2	Magnesium	11000		5770	ppb
699-48-77A	17-May-93	B08JD2	Manganese	20		5.6	ppb
699-48-77A	17-May-93	B08JD2	Mercury	0.2	U		ppb
699-48-77A	17-May-93	B08JD2	Nickel	110		29.2	ppb
699-48-77A	17-May-93	B08JD2	Potassium	3000		2870	ppb
699-48-77A	17-May-93	B08JD2	Silver	20	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-May-93	B08JD2	Sodium	11000		3430	ppb
699-48-77A	17-May-93	B08JD2	Tin	0	U		
699-48-77A	17-May-93	B08JD2	Antimony	200	U		ppb
699-48-77A	17-May-93	B08JD2	Arsenic	1	L	0.801	ppb
699-48-77A	17-May-93	B08JD2	Barium	60		0.18	ppb
699-48-77A	17-May-93	B08JD2	Beryllium	3	U		ppb
699-48-77A	17-May-93	B08JD2	Cadmium	10	U		ppb
699-48-77A	17-May-93	B08JD2	Chromium	190		49.4	ppb
699-48-77A	17-May-93	B08JD2	Cobalt	20	U		ppb
699-48-77A	17-May-93	B08JD2	Copper	15	L	2.09	ppb
699-48-77A	17-May-93	B08JD2	Vanadium	9.1	L	1.88	ppb
699-48-77A	17-May-93	B08JD2	Zinc	20		6.24	ppb
699-48-77A	17-May-93	B08JD2	Calcium	29000		8790	ppb
699-48-77A	17-May-93	B08JD2	Selenium	1	L	0.561	ppb
699-48-77A	17-May-93	B08JD2	Coliforms	1	U		Col/dL
699-48-77A	17-May-93	B08JD2	Specific conductance	290			umho/cm
699-48-77A	17-May-93	B08JD2	pH	7.9			pH
699-48-77A	17-May-93	B08JD6	Aluminum, filtered	0	U		
699-48-77A	17-May-93	B08JD6	Iron, filtered	13	L	5.81	ppb
699-48-77A	17-May-93	B08JD6	Lead, filtered	5	U		ppb
699-48-77A	17-May-93	B08JD6	Magnesium, filtered	11000		5770	ppb
699-48-77A	17-May-93	B08JD6	Manganese, filtered	10	U		ppb
699-48-77A	17-May-93	B08JD6	Mercury, filtered	0.2	U		ppb
699-48-77A	17-May-93	B08JD6	Nickel, filtered	30	U		ppb
699-48-77A	17-May-93	B08JD6	Potassium, filtered	3000		2870	ppb
699-48-77A	17-May-93	B08JD6	Silver, filtered	20	U		ppb
699-48-77A	17-May-93	B08JD6	Sodium, filtered	10000		3120	ppb
699-48-77A	17-May-93	B08JD6	Tin, filtered	0	U		
699-48-77A	17-May-93	B08JD6	Antimony, filtered	200	U		ppb
699-48-77A	17-May-93	B08JD6	Arsenic, filtered	1	L	0.801	ppb
699-48-77A	17-May-93	B08JD6	Barium, filtered	50		0.15	ppb
699-48-77A	17-May-93	B08JD6	Beryllium, filtered	3	U		ppb
699-48-77A	17-May-93	B08JD6	Cadmium, filtered	10	U		ppb
699-48-77A	17-May-93	B08JD6	Chromium, filtered	10	L	2.6	ppb
699-48-77A	17-May-93	B08JD6	Cobalt, filtered	20	U		ppb
699-48-77A	17-May-93	B08JD6	Copper, filtered	30		4.18	ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-May-93	B08JD6	Vanadium, filtered	5.2	L	1.07	ppb
699-48-77A	17-May-93	B08JD6	Zinc, filtered	4	L	1.25	ppb
699-48-77A	17-May-93	B08JD6	Calcium, filtered	29000		8790	ppb
699-48-77A	17-May-93	B08JD6	Selenium, filtered	10	U		ppb
699-48-77A	02-Sep-93	B090T6	Chloride	3600		596	ppb
699-48-77A	02-Sep-93	B090T6	Phosphate	147	U		ppb
699-48-77A	02-Sep-93	B090T6	Nitrate	16000	D	1390	ppb
699-48-77A	02-Sep-93	B090T6	Nitrite	38.3	U		ppb
699-48-77A	02-Sep-93	B090T6	Sulfate	23000	D	1120	ppb
699-48-77A	02-Sep-93	B090T6	Fluoride	500		32.7	ppb
699-48-77A	02-Sep-93	B090T6	Bromide	52.8	U		ppb
699-48-77A	02-Sep-93	B090T6	Hydrazine	1.89	U		ppb
699-48-77A	02-Sep-93	B090T6	Cyanide	1.24	U		ppb
699-48-77A	02-Sep-93	B090T6	Aluminum	83	L		ppb
699-48-77A	02-Sep-93	B090T6	Iron	420		188	ppb
699-48-77A	02-Sep-93	B090T6	Lead	1.4	L	0.292	ppb
699-48-77A	02-Sep-93	B090T6	Magnesium	11000		5770	ppb
699-48-77A	02-Sep-93	B090T6	Manganese	11		3.08	ppb
699-48-77A	02-Sep-93	B090T6	Mercury	0.158	U		ppb
699-48-77A	02-Sep-93	B090T6	Nickel	52		13.8	ppb
699-48-77A	02-Sep-93	B090T6	Potassium	3900		3730	ppb
699-48-77A	02-Sep-93	B090T6	Silver	2.87	U		ppb
699-48-77A	02-Sep-93	B090T6	Sodium	9100		2840	ppb
699-48-77A	02-Sep-93	B090T6	Tin	51.1	U		ppb
699-48-77A	02-Sep-93	B090T6	Antimony	69.4	U		ppb
699-48-77A	02-Sep-93	B090T6	Arsenic	1.38	U		ppb
699-48-77A	02-Sep-93	B090T6	Barium	57		0.171	ppb
699-48-77A	02-Sep-93	B090T6	Beryllium	0.814	U		ppb
699-48-77A	02-Sep-93	B090T6	Cadmium	4.7	U		ppb
699-48-77A	02-Sep-93	B090T6	Chromium	76		19.8	ppb
699-48-77A	02-Sep-93	B090T6	Cobalt	4.05	U		ppb
699-48-77A	02-Sep-93	B090T6	Copper	2.65	U		ppb
699-48-77A	02-Sep-93	B090T6	Vanadium	6.1	L	1.26	ppb
699-48-77A	02-Sep-93	B090T6	Zinc	22		6.86	ppb
699-48-77A	02-Sep-93	B090T6	Calcium	29000		8790	ppb
699-48-77A	02-Sep-93	B090T6	Selenium	1.21	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	02-Sep-93	B090T6	Coliforms	1	U		Col/dL
699-48-77A	02-Sep-93	B090T6	Specific conductance	290			umho/cm
699-48-77A	02-Sep-93	B090T6	pH	8			pH
699-48-77A	02-Sep-93	B090V0	Aluminum, filtered	40	L		ppb
699-48-77A	02-Sep-93	B090V0	Iron, filtered	25		11.2	ppb
699-48-77A	02-Sep-93	B090V0	Lead, filtered	1.6	L	0.334	ppb
699-48-77A	02-Sep-93	B090V0	Magnesium, filtered	11000		5770	ppb
699-48-77A	02-Sep-93	B090V0	Manganese, filtered	5.1	L	1.43	ppb
699-48-77A	02-Sep-93	B090V0	Mercury, filtered	0.158	U		ppb
699-48-77A	02-Sep-93	B090V0	Nickel, filtered	17.9	U		ppb
699-48-77A	02-Sep-93	B090V0	Potassium, filtered	1900		1820	ppb
699-48-77A	02-Sep-93	B090V0	Silver, filtered	3.2	L	0.752	ppb
699-48-77A	02-Sep-93	B090V0	Sodium, filtered	9100		2840	ppb
699-48-77A	02-Sep-93	B090V0	Tin, filtered	51.1	U		ppb
699-48-77A	02-Sep-93	B090V0	Antimony, filtered	69.4	U		ppb
699-48-77A	02-Sep-93	B090V0	Arsenic, filtered	1.38	U		ppb
699-48-77A	02-Sep-93	B090V0	Barium, filtered	57		0.171	ppb
699-48-77A	02-Sep-93	B090V0	Beryllium, filtered	0.814	U		ppb
699-48-77A	02-Sep-93	B090V0	Cadmium, filtered	4.7	U		ppb
699-48-77A	02-Sep-93	B090V0	Chromium, filtered	13	L	3.38	ppb
699-48-77A	02-Sep-93	B090V0	Cobalt, filtered	4.05	U		ppb
699-48-77A	02-Sep-93	B090V0	Copper, filtered	2.65	U		ppb
699-48-77A	02-Sep-93	B090V0	Vanadium, filtered	9.5	L	1.96	ppb
699-48-77A	02-Sep-93	B090V0	Zinc, filtered	23		7.18	ppb
699-48-77A	02-Sep-93	B090V0	Calcium, filtered	28000		8480	ppb
699-48-77A	02-Sep-93	B090V0	Selenium, filtered	1.21	U		ppb
699-48-77A	15-Oct-93	B09B39	Ammonium ion	70	L		ppb
699-48-77A	15-Oct-93	B09B39	Hydrazine	1.89	U		ppb
699-48-77A	15-Oct-93	B09B39	Aluminum	150	L	58.5	ppb
699-48-77A	15-Oct-93	B09B39	Iron	730		394	ppb
699-48-77A	15-Oct-93	B09B39	Magnesium	12000		9000	ppb
699-48-77A	15-Oct-93	B09B39	Manganese	18		7.02	ppb
699-48-77A	15-Oct-93	B09B39	Nickel	66		13.9	ppb
699-48-77A	15-Oct-93	B09B39	Potassium	3000		1080	ppb
699-48-77A	15-Oct-93	B09B39	Silver	2.87	U		ppb
699-48-77A	15-Oct-93	B09B39	Sodium	8900		2670	ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	15-Oct-93	B09B39	Tin	51.1	U		ppb
699-48-77A	15-Oct-93	B09B39	Antimony	69.4	U		ppb
699-48-77A	15-Oct-93	B09B39	Barium	63		20.8	ppb
699-48-77A	15-Oct-93	B09B39	Beryllium	0.814	U		ppb
699-48-77A	15-Oct-93	B09B39	Cadmium	4.7	U		ppb
699-48-77A	15-Oct-93	B09B39	Chromium	84		25.2	ppb
699-48-77A	15-Oct-93	B09B39	Cobalt	4.05	U		ppb
699-48-77A	15-Oct-93	B09B39	Copper	2.65	U		ppb
699-48-77A	15-Oct-93	B09B39	Vanadium	3.84	U		ppb
699-48-77A	15-Oct-93	B09B39	Zinc	61		18.3	ppb
699-48-77A	15-Oct-93	B09B39	Calcium	30000		10800	ppb
699-48-77A	15-Oct-93	B09B39	Specific conductance	280			umho/cm
699-48-77A	15-Oct-93	B09B39	Total dissolved solids	180			ppm
699-48-77A	15-Oct-93	B09B39	Turbidity	5.6			NTU
699-48-77A	15-Oct-93	B09B40	Specific conductance	280			umho/cm
699-48-77A	15-Oct-93	B09B41	Specific conductance	280			umho/cm
699-48-77A	15-Oct-93	B09B42	Specific conductance	280			umho/cm
699-48-77A	17-Jan-94	B09Q40	Ammonium ion	40	L		ppb
699-48-77A	17-Jan-94	B09Q40	Hydrazine	1.89	U		ppb
699-48-77A	17-Jan-94	B09Q40	Aluminum	59	L	47.8	ppb
699-48-77A	17-Jan-94	B09Q40	Iron	420		75.6	ppb
699-48-77A	17-Jan-94	B09Q40	Magnesium	11000		1650	ppb
699-48-77A	17-Jan-94	B09Q40	Manganese	8.7	L	2.61	ppb
699-48-77A	17-Jan-94	B09Q40	Nickel	40		15.6	ppb
699-48-77A	17-Jan-94	B09Q40	Potassium	2700		405	ppb
699-48-77A	17-Jan-94	B09Q40	Silver	2.87	U		ppb
699-48-77A	17-Jan-94	B09Q40	Sodium	8300	B	2490	ppb
699-48-77A	17-Jan-94	B09Q40	Tin	51.1	U		ppb
699-48-77A	17-Jan-94	B09Q40	Antimony	69.4	U		ppb
699-48-77A	17-Jan-94	B09Q40	Barium	59		1.77	ppb
699-48-77A	17-Jan-94	B09Q40	Beryllium	0.814	U		ppb
699-48-77A	17-Jan-94	B09Q40	Cadmium	4.7	U		ppb
699-48-77A	17-Jan-94	B09Q40	Chromium	69		14.5	ppb
699-48-77A	17-Jan-94	B09Q40	Cobalt	4.05	U		ppb
699-48-77A	17-Jan-94	B09Q40	Copper	2.65	U		ppb
699-48-77A	17-Jan-94	B09Q40	Vanadium	8.1	L	1.94	ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-Jan-94	B09Q40	Zinc	26		0.78	ppb
699-48-77A	17-Jan-94	B09Q40	Calcium	29000		5220	ppb
699-48-77A	17-Jan-94	B09Q40	Specific conductance	280			umho/cm
699-48-77A	17-Jan-94	B09Q40	Total dissolved solids	190			ppm
699-48-77A	17-Jan-94	B09Q40	Turbidity	3.4			NTU
699-48-77A	17-Jan-94	B09Q41	Specific conductance	280			umho/cm
699-48-77A	17-Jan-94	B09Q42	Specific conductance	280			umho/cm
699-48-77A	17-Jan-94	B09Q43	Specific conductance	280			umho/cm
699-48-77A	15-Apr-94	B0BRD9	Chloride	3200		1060	ppb
699-48-77A	15-Apr-94	B0BRD9	Phosphate	147	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Nitrate	16000	D		ppb
699-48-77A	15-Apr-94	B0BRD9	Nitrite	38.3	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Sulfate	21000	D	4410	ppb
699-48-77A	15-Apr-94	B0BRD9	Fluoride	700		399	ppb
699-48-77A	15-Apr-94	B0BRD9	Bromide	52.8	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aluminum	20	L	4.2	ppb
699-48-77A	15-Apr-94	B0BRD9	Iron	320		106	ppb
699-48-77A	15-Apr-94	B0BRD9	Magnesium	12000		2880	ppb
699-48-77A	15-Apr-94	B0BRD9	Manganese	9.2	L	1.66	ppb
699-48-77A	15-Apr-94	B0BRD9	Nickel	53		14.3	ppb
699-48-77A	15-Apr-94	B0BRD9	Potassium	3600		432	ppb
699-48-77A	15-Apr-94	B0BRD9	Silver	3.4	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Sodium	8500		4590	ppb
699-48-77A	15-Apr-94	B0BRD9	Tin	24	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Antimony	26	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Barium	61		14.6	ppb
699-48-77A	15-Apr-94	B0BRD9	Beryllium	1.5	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Cadmium	3	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Chromium	43		20.6	ppb
699-48-77A	15-Apr-94	B0BRD9	Cobalt	6.5	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Copper	2.6	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Vanadium	6.7	L	2.21	ppb
699-48-77A	15-Apr-94	B0BRD9	Zinc	19		6.27	ppb
699-48-77A	15-Apr-94	B0BRD9	Calcium	32000		6720	ppb
699-48-77A	15-Apr-94	B0BRD9	Coliforms	1	U		Col/dL
699-48-77A	15-Apr-94	B0BRD9	Specific conductance	280			umho/cm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	15-Apr-94	B0BRD9	pH	8			pH
699-48-77A	15-Apr-94	B0BRD9	Total dissolved solids	180			ppm
699-48-77A	15-Apr-94	B0BRD9	Turbidity	4.1			NTU
699-48-77A	15-Apr-94	B0BRF3	Aluminum, filtered	19	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Iron, filtered	46		15.2	ppb
699-48-77A	15-Apr-94	B0BRF3	Magnesium, filtered	12000		2880	ppb
699-48-77A	15-Apr-94	B0BRF3	Manganese, filtered	4	L	0.72	ppb
699-48-77A	15-Apr-94	B0BRF3	Nickel, filtered	26	L	7.02	ppb
699-48-77A	15-Apr-94	B0BRF3	Potassium, filtered	3800		456	ppb
699-48-77A	15-Apr-94	B0BRF3	Silver, filtered	3.4	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Sodium, filtered	8900		4810	ppb
699-48-77A	15-Apr-94	B0BRF3	Tin, filtered	24	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Antimony, filtered	26	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Barium, filtered	59		14.2	ppb
699-48-77A	15-Apr-94	B0BRF3	Beryllium, filtered	1.5	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Cadmium, filtered	3	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Chromium, filtered	21		10.1	ppb
699-48-77A	15-Apr-94	B0BRF3	Cobalt, filtered	6.5	U		ppb
699-48-77A	15-Apr-94	B0BRF3	Copper, filtered	3.9	L	0.468	ppb
699-48-77A	15-Apr-94	B0BRF3	Vanadium, filtered	11	L	3.63	ppb
699-48-77A	15-Apr-94	B0BRF3	Zinc, filtered	7.7	L	2.54	ppb
699-48-77A	15-Apr-94	B0BRF3	Calcium, filtered	32000		6720	ppb
699-48-77A	10-Aug-94	B0C754	Specific conductance	290			umho/cm
699-48-77A	10-Aug-94	B0C754	pH	7.8			pH
699-48-77A	10-Aug-94	B0C754	Turbidity	3.5			NTU
699-48-77C	23-May-94	B0BTY4	Chloride	5000		1650	ppb
699-48-77C	23-May-94	B0BTY4	Phosphate	470	U		ppb
699-48-77C	23-May-94	B0BTY4	Nitrate	21000	D		ppb
699-48-77C	23-May-94	B0BTY4	Nitrite	110	U		ppb
699-48-77C	23-May-94	B0BTY4	Sulfate	19000	D	3990	ppb
699-48-77C	23-May-94	B0BTY4	Fluoride	600		342	ppb
699-48-77C	23-May-94	B0BTY4	Sulfide	200	U		ppb
699-48-77C	23-May-94	B0BTY4	Bromide	110	U		ppb
699-48-77C	23-May-94	B0BTY4	Coliforms	1	U		Col/dL
699-48-77C	23-May-94	B0BTY4	Specific conductance	290			umho/cm
699-48-77C	23-May-94	B0BTY4	Total dissolved solids	180			ppm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	Turbidity	3.9			NTU
699-48-77C	23-May-94	B0BTY8	Aluminum, filtered	19	U		ppb
699-48-77C	23-May-94	B0BTY8	Iron, filtered	23	B	7.59	ppb
699-48-77C	23-May-94	B0BTY8	Lead, filtered	0.72	BL	0.216	ppb
699-48-77C	23-May-94	B0BTY8	Magnesium, filtered	10000		2400	ppb
699-48-77C	23-May-94	B0BTY8	Manganese, filtered	25		4.5	ppb
699-48-77C	23-May-94	B0BTY8	Mercury, filtered	0.095	U		ppb
699-48-77C	23-May-94	B0BTY8	Nickel, filtered	16	U		ppb
699-48-77C	23-May-94	B0BTY8	Potassium, filtered	3800		456	ppb
699-48-77C	23-May-94	B0BTY8	Silver, filtered	3.4	U		ppb
699-48-77C	23-May-94	B0BTY8	Sodium, filtered	9000		4860	ppb
699-48-77C	23-May-94	B0BTY8	Thallium, filtered	1.2	U		ppb
699-48-77C	23-May-94	B0BTY8	Tin, filtered	24	U		ppb
699-48-77C	23-May-94	B0BTY8	Antimony, filtered	26	U		ppb
699-48-77C	23-May-94	B0BTY8	Arsenic, filtered	2	L	0.6	ppb
699-48-77C	23-May-94	B0BTY8	Barium, filtered	30		7.2	ppb
699-48-77C	23-May-94	B0BTY8	Beryllium, filtered	1.5	U		ppb
699-48-77C	23-May-94	B0BTY8	Cadmium, filtered	3	U		ppb
699-48-77C	23-May-94	B0BTY8	Chromium, filtered	11	U		ppb
699-48-77C	23-May-94	B0BTY8	Cobalt, filtered	6.5	U		ppb
699-48-77C	23-May-94	B0BTY8	Copper, filtered	2.6	U		ppb
699-48-77C	23-May-94	B0BTY8	Vanadium, filtered	23	L	7.59	ppb
699-48-77C	23-May-94	B0BTY8	Zinc, filtered	67		22.1	ppb
699-48-77C	23-May-94	B0BTY8	Calcium, filtered	31000		6510	ppb
699-48-77C	23-May-94	B0BTY8	Selenium, filtered	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Chloride	5000		1650	ppb
699-48-77C	10-Aug-94	B0C7N8	Phosphate	470	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Nitrate	22000	D		ppb
699-48-77C	10-Aug-94	B0C7N8	Nitrite	110	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Sulfate	18000	D	3780	ppb
699-48-77C	10-Aug-94	B0C7N8	Fluoride	600		342	ppb
699-48-77C	10-Aug-94	B0C7N8	Sulfide	200	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bromide	110	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Coliforms	1	U		Col/dL
699-48-77C	10-Aug-94	B0C7N8	Specific conductance	280			umho/cm
699-48-77C	10-Aug-94	B0C7N8	Total dissolved solids	200			ppm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	Turbidity	2.4			NTU
699-48-77C	10-Aug-94	B0C7P2	Aluminum, filtered	19	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Iron, filtered	28		9.24	ppb
699-48-77C	10-Aug-94	B0C7P2	Lead, filtered	1.5	BL	0.45	ppb
699-48-77C	10-Aug-94	B0C7P2	Magnesium, filtered	11000		2640	ppb
699-48-77C	10-Aug-94	B0C7P2	Manganese, filtered	7.4	L	1.33	ppb
699-48-77C	10-Aug-94	B0C7P2	Mercury, filtered	0.095	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Nickel, filtered	16	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Potassium, filtered	3600		432	ppb
699-48-77C	10-Aug-94	B0C7P2	Silver, filtered	3.4	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Sodium, filtered	8300		4480	ppb
699-48-77C	10-Aug-94	B0C7P2	Thallium, filtered	1.3	L	0.813	ppb
699-48-77C	10-Aug-94	B0C7P2	Tin, filtered	24	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Antimony, filtered	26	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Arsenic, filtered	2.4	L	0.72	ppb
699-48-77C	10-Aug-94	B0C7P2	Barium, filtered	26		6.24	ppb
699-48-77C	10-Aug-94	B0C7P2	Beryllium, filtered	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Cadmium, filtered	3	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Chromium, filtered	11	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Cobalt, filtered	6.5	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Copper, filtered	2.6	U		ppb
699-48-77C	10-Aug-94	B0C7P2	Vanadium, filtered	27	L	8.91	ppb
699-48-77C	10-Aug-94	B0C7P2	Zinc, filtered	5.5	LB	1.82	ppb
699-48-77C	10-Aug-94	B0C7P2	Calcium, filtered	32000		6720	ppb
699-48-77C	10-Aug-94	B0C7P2	Selenium, filtered	2	L	2.4	ppb
699-48-77D	23-May-94	B0BTY9	Chloride	6300		2080	ppb
699-48-77D	23-May-94	B0BTY9	Phosphate	470	U		ppb
699-48-77D	23-May-94	B0BTY9	Nitrate	21000	D		ppb
699-48-77D	23-May-94	B0BTY9	Nitrite	110	U		ppb
699-48-77D	23-May-94	B0BTY9	Sulfate	22000	D	4620	ppb
699-48-77D	23-May-94	B0BTY9	Fluoride	600		342	ppb
699-48-77D	23-May-94	B0BTY9	Sulfide	200	U		ppb
699-48-77D	23-May-94	B0BTY9	Bromide	110	U		ppb
699-48-77D	23-May-94	B0BTY9	Coliforms	1	U		Col/dL
699-48-77D	23-May-94	B0BTY9	Specific conductance	290			umho/cm
699-48-77D	23-May-94	B0BTY9	Total dissolved solids	190			ppm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	Turbidity	9.9			NTU
699-48-77D	23-May-94	B0BTZ3	Aluminum, filtered	19	U		ppb
699-48-77D	23-May-94	B0BTZ3	Iron, filtered	18	U		ppb
699-48-77D	23-May-94	B0BTZ3	Lead, filtered	1.1	BL	0.33	ppb
699-48-77D	23-May-94	B0BTZ3	Magnesium, filtered	12000		2880	ppb
699-48-77D	23-May-94	B0BTZ3	Manganese, filtered	16		2.88	ppb
699-48-77D	23-May-94	B0BTZ3	Mercury, filtered	0.095	U		ppb
699-48-77D	23-May-94	B0BTZ3	Nickel, filtered	16	U		ppb
699-48-77D	23-May-94	B0BTZ3	Potassium, filtered	3600		432	ppb
699-48-77D	23-May-94	B0BTZ3	Silver, filtered	3.4	U		ppb
699-48-77D	23-May-94	B0BTZ3	Sodium, filtered	8400		4540	ppb
699-48-77D	23-May-94	B0BTZ3	Thallium, filtered	1.2	U		ppb
699-48-77D	23-May-94	B0BTZ3	Tin, filtered	24	U		ppb
699-48-77D	23-May-94	B0BTZ3	Antimony, filtered	26	U		ppb
699-48-77D	23-May-94	B0BTZ3	Arsenic, filtered	2.9	L	0.87	ppb
699-48-77D	23-May-94	B0BTZ3	Barium, filtered	30		7.2	ppb
699-48-77D	23-May-94	B0BTZ3	Beryllium, filtered	1.5	U		ppb
699-48-77D	23-May-94	B0BTZ3	Cadmium, filtered	3	U		ppb
699-48-77D	23-May-94	B0BTZ3	Chromium, filtered	11	U		ppb
699-48-77D	23-May-94	B0BTZ3	Cobalt, filtered	6.5	U		ppb
699-48-77D	23-May-94	B0BTZ3	Copper, filtered	2.6	U		ppb
699-48-77D	23-May-94	B0BTZ3	Vanadium, filtered	22	L	7.26	ppb
699-48-77D	23-May-94	B0BTZ3	Zinc, filtered	14		4.62	ppb
699-48-77D	23-May-94	B0BTZ3	Calcium, filtered	30000		6300	ppb
699-48-77D	23-May-94	B0BTZ3	Selenium, filtered	3	L	3.6	ppb
699-48-77D	10-Aug-94	B0C7P3	Chloride	6400		2110	ppb
699-48-77D	10-Aug-94	B0C7P3	Phosphate	470	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Nitrate	21000	D		ppb
699-48-77D	10-Aug-94	B0C7P3	Nitrite	110	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Sulfate	21000	D	4410	ppb
699-48-77D	10-Aug-94	B0C7P3	Fluoride	600		342	ppb
699-48-77D	10-Aug-94	B0C7P3	Sulfide	200	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bromide	110	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Coliforms	1	U		Col/dL
699-48-77D	10-Aug-94	B0C7P3	Specific conductance	300			umho/cm
699-48-77D	10-Aug-94	B0C7P3	Total dissolved solids	200			ppm

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	Turbidity	3.7			NTU
699-48-77D	10-Aug-94	B0C7P7	Aluminum, filtered	19	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Iron, filtered	23		7.59	ppb
699-48-77D	10-Aug-94	B0C7P7	Lead, filtered	1.4	BL	0.42	ppb
699-48-77D	10-Aug-94	B0C7P7	Magnesium, filtered	12000		2880	ppb
699-48-77D	10-Aug-94	B0C7P7	Manganese, filtered	2.6	L	0.468	ppb
699-48-77D	10-Aug-94	B0C7P7	Mercury, filtered	0.095	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Nickel, filtered	16	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Potassium, filtered	3200		384	ppb
699-48-77D	10-Aug-94	B0C7P7	Silver, filtered	3.4	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Sodium, filtered	7800		4210	ppb
699-48-77D	10-Aug-94	B0C7P7	Thallium, filtered	1.2	L	0.775	ppb
699-48-77D	10-Aug-94	B0C7P7	Tin, filtered	24	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Antimony, filtered	26	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Arsenic, filtered	2	L	0.6	ppb
699-48-77D	10-Aug-94	B0C7P7	Barium, filtered	26		6.24	ppb
699-48-77D	10-Aug-94	B0C7P7	Beryllium, filtered	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Cadmium, filtered	3	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Chromium, filtered	11	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Cobalt, filtered	6.5	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Copper, filtered	2.6	U		ppb
699-48-77D	10-Aug-94	B0C7P7	Vanadium, filtered	23	L	7.59	ppb
699-48-77D	10-Aug-94	B0C7P7	Zinc, filtered	10	B	3.3	ppb
699-48-77D	10-Aug-94	B0C7P7	Calcium, filtered	31000		6510	ppb
699-48-77D	10-Aug-94	B0C7P7	Selenium, filtered	2	L	2.4	ppb

APPENDIX C.3

ORGANIC CONSTITUENTS

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Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	19-Jun-92	B06W97	1,1,1-Trichloroethane	0	U		
699-48-77A	19-Jun-92	B06W97	1,1,2-Trichloroethane	0	U		
699-48-77A	19-Jun-92	B06W97	1,1-Dichloroethane	0	U		
699-48-77A	19-Jun-92	B06W97	1,2-Dichloroethane	0	U		
699-48-77A	19-Jun-92	B06W97	1,2-Dichloroethene	0	U		
699-48-77A	19-Jun-92	B06W97	1,4-Dichlorobenzene	0	U		
699-48-77A	19-Jun-92	B06W97	1-Butanol	0	U		
699-48-77A	19-Jun-92	B06W97	2-Methylphenol	0	U		
699-48-77A	19-Jun-92	B06W97	4,4'-DDD	0	U		
699-48-77A	19-Jun-92	B06W97	4,4'-DDE	0	U		
699-48-77A	19-Jun-92	B06W97	4,4'-DDT	0	U		
699-48-77A	19-Jun-92	B06W97	4-Methyl-2-pentanone	0	U		
699-48-77A	19-Jun-92	B06W97	4-Methylphenol	0	U		
699-48-77A	19-Jun-92	B06W97	Acetone	0	U		
699-48-77A	19-Jun-92	B06W97	Aldrin	0	U		
699-48-77A	19-Jun-92	B06W97	Alpha-BHC	0	U		
699-48-77A	19-Jun-92	B06W97	Benzene	0	U		
699-48-77A	19-Jun-92	B06W97	Beta-BHC	0	U		
699-48-77A	19-Jun-92	B06W97	Carbon tetrachloride	1.3	J		ppb
699-48-77A	19-Jun-92	B06W97	Chlordane	0	U		
699-48-77A	19-Jun-92	B06W97	Chloroform	0	U		
699-48-77A	19-Jun-92	B06W97	Decane	0	U		
699-48-77A	19-Jun-92	B06W97	Delta-BHC	0	U		
699-48-77A	19-Jun-92	B06W97	Dieldrin	0	U		
699-48-77A	19-Jun-92	B06W97	Dodecane	0	U		
699-48-77A	19-Jun-92	B06W97	Endosulfan I	0	U		
699-48-77A	19-Jun-92	B06W97	Endosulfan II	0	U		
699-48-77A	19-Jun-92	B06W97	Endosulfan sulfate	0	U		
699-48-77A	19-Jun-92	B06W97	Endrin	0	U		
699-48-77A	19-Jun-92	B06W97	Endrin Aldehyde	0	U		
699-48-77A	19-Jun-92	B06W97	Heptachlor	0	U		
699-48-77A	19-Jun-92	B06W97	Heptachlor epoxide	0	U		
699-48-77A	19-Jun-92	B06W97	Methoxychlor	0	U		
699-48-77A	19-Jun-92	B06W97	Methyl ethyl ketone	0	U		
699-48-77A	19-Jun-92	B06W97	Methylene chloride	0	U		
699-48-77A	19-Jun-92	B06W97	Naphthalene	0	U		

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	19-Jun-92	B06W97	Pentachlorophenol	0	U		
699-48-77A	19-Jun-92	B06W97	Phenol	0	U		
699-48-77A	19-Jun-92	B06W97	Tetrachloroethene	0	U		
699-48-77A	19-Jun-92	B06W97	Tetradecane	0	U		
699-48-77A	19-Jun-92	B06W97	Tetrahydrofuran	0	U		
699-48-77A	19-Jun-92	B06W97	Toluene	0	U		
699-48-77A	19-Jun-92	B06W97	Total organic carbon	0	U		
699-48-77A	19-Jun-92	B06W97	Total organic halogen	20		5.26	ppb
699-48-77A	19-Jun-92	B06W97	Toxaphene	0	U		
699-48-77A	19-Jun-92	B06W97	Tributyl Phosphate	0	U		
699-48-77A	19-Jun-92	B06W97	Trichloroethene	0	U		
699-48-77A	19-Jun-92	B06W97	Vinyl chloride	0	U		
699-48-77A	19-Jun-92	B06W97	Xylenes (total)	0	U		
699-48-77A	19-Jun-92	B06W97	gamma-BHC (Lindane)	0	U		
699-48-77A	19-Jun-92	B06W97	m-Cresol	0	U		
699-48-77A	02-Sep-92	B078V0	4,4'-DDD	0	U		
699-48-77A	02-Sep-92	B078V0	4,4'-DDE	0	U		
699-48-77A	02-Sep-92	B078V0	4,4'-DDT	0	U		
699-48-77A	02-Sep-92	B078V0	Aldrin	0	U		
699-48-77A	02-Sep-92	B078V0	Alpha-BHC	0	U		
699-48-77A	02-Sep-92	B078V0	Beta-BHC	0	U		
699-48-77A	02-Sep-92	B078V0	Chlordane	0	U		
699-48-77A	02-Sep-92	B078V0	Delta-BHC	0	U		
699-48-77A	02-Sep-92	B078V0	Dieldrin	0	U		
699-48-77A	02-Sep-92	B078V0	Endosulfan I	0	U		
699-48-77A	02-Sep-92	B078V0	Endosulfan II	0	U		
699-48-77A	02-Sep-92	B078V0	Endosulfan sulfate	0	U		
699-48-77A	02-Sep-92	B078V0	Endrin	0	U		
699-48-77A	02-Sep-92	B078V0	Endrin Aldehyde	0	U		
699-48-77A	02-Sep-92	B078V0	Heptachlor	0	U		
699-48-77A	02-Sep-92	B078V0	Heptachlor epoxide	0	U		
699-48-77A	02-Sep-92	B078V0	Methoxychlor	0	U		
699-48-77A	02-Sep-92	B078V0	Toxaphene	0	U		
699-48-77A	02-Sep-92	B078V0	gamma-BHC (Lindane)	0	U		
699-48-77A	02-Nov-92	B07LG2	1,1,1-Trichloroethane	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	1,1,2-Trichloroethane	5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	02-Nov-92	B07LG2	1,1-Dichloroethane	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	1,2-Dichloroethane	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	1,4-Dichlorobenzene	.5	U		ppb
699-48-77A	02-Nov-92	B07LG2	1-Butanol	1	U		ppb
699-48-77A	02-Nov-92	B07LG2	2-Methylphenol	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	4-Methyl-2-pentanone	50	U		ppb
699-48-77A	02-Nov-92	B07LG2	4-Methylphenol	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Acetone	19	B		ppb
699-48-77A	02-Nov-92	B07LG2	Benzene	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Carbon tetrachloride	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Chloroform	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Decane	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Dodecane	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Methyl ethyl ketone	100	U		ppb
699-48-77A	02-Nov-92	B07LG2	Methylene chloride	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Naphthalene	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Pentachlorophenol	50	U		ppb
699-48-77A	02-Nov-92	B07LG2	Phenol	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Tetrachloroethene	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Tetradecane	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Tetrahydrofuran	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Toluene	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Total organic halogen	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Tributyl Phosphate	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Trichloroethene	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	Vinyl chloride	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	Xylenes (total)	5	U		ppb
699-48-77A	02-Nov-92	B07LG2	m-Cresol	10	U		ppb
699-48-77A	02-Nov-92	B07LG2	trans-1,2-Dichloroethylene	5	U		ppb
699-48-77A	02-Nov-92	B07LG3	Total organic halogen	10	U		ppb
699-48-77A	02-Nov-92	B07LG4	Total organic halogen	10	U		ppb
699-48-77A	02-Nov-92	B07LG5	Total organic halogen	10	U		ppb
699-48-77A	22-Feb-93	B08702	1,1,1-Trichloroethane	0.5	U		ppb
699-48-77A	22-Feb-93	B08702	1,1,2-Trichloroethane	0.5	U		ppb
699-48-77A	22-Feb-93	B08702	1,1-Dichloroethane	1	U		ppb
699-48-77A	22-Feb-93	B08702	1,2-Dichloroethane	0.5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	22-Feb-93	B08702	1,4-Dichlorobenzene	2	U		ppb
699-48-77A	22-Feb-93	B08702	2-Methylphenol	10	U		ppb
699-48-77A	22-Feb-93	B08702	4,4'-DDD	0.1	U		ppb
699-48-77A	22-Feb-93	B08702	4,4'-DDE	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	4,4'-DDT	0.1	U		ppb
699-48-77A	22-Feb-93	B08702	4-Methylphenol	10	U		ppb
699-48-77A	22-Feb-93	B08702	Aldrin	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	Alpha-BHC	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	Benzene	2	U		ppb
699-48-77A	22-Feb-93	B08702	Beta-BHC	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	Carbon tetrachloride	1	U		ppb
699-48-77A	22-Feb-93	B08702	Chlordane	0.1	U		ppb
699-48-77A	22-Feb-93	B08702	Chloroform	0.5	U		ppb
699-48-77A	22-Feb-93	B08702	Decane	10	U		ppb
699-48-77A	22-Feb-93	B08702	Delta-BHC	0.1	U		ppb
699-48-77A	22-Feb-93	B08702	Dieldrin	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	Dodecane	10	U		ppb
699-48-77A	22-Feb-93	B08702	Endosulfan I	0.1	U		ppb
699-48-77A	22-Feb-93	B08702	Endosulfan II	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	Endosulfan sulfate	0.5	U		ppb
699-48-77A	22-Feb-93	B08702	Endrin	0.1	U		ppb
699-48-77A	22-Feb-93	B08702	Endrin Aldehyde	0.2	U		ppb
699-48-77A	22-Feb-93	B08702	Ethylbenzene	2	U		ppb
699-48-77A	22-Feb-93	B08702	Heptachlor	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	Heptachlor epoxide	1	U		ppb
699-48-77A	22-Feb-93	B08702	Methoxychlor	2	U		ppb
699-48-77A	22-Feb-93	B08702	Methylene chloride	5	U		ppb
699-48-77A	22-Feb-93	B08702	Naphthalene	10	U		ppb
699-48-77A	22-Feb-93	B08702	Pentachlorophenol	50	U		ppb
699-48-77A	22-Feb-93	B08702	Phenol	10	U		ppb
699-48-77A	22-Feb-93	B08702	Tetrachloroethene	0.5	U		ppb
699-48-77A	22-Feb-93	B08702	Tetradecane	10	U		ppb
699-48-77A	22-Feb-93	B08702	Toluene	2	U		ppb
699-48-77A	22-Feb-93	B08702	Total organic carbon	1000	U		ppb
699-48-77A	22-Feb-93	B08702	Total organic halogen	10	U		ppb
699-48-77A	22-Feb-93	B08702	Toxaphene	2	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	22-Feb-93	B08702	Tributyl Phosphate	10	U		ppb
699-48-77A	22-Feb-93	B08702	Trichloroethene	1	U		ppb
699-48-77A	22-Feb-93	B08702	Vinyl chloride	.2	U		ppb
699-48-77A	22-Feb-93	B08702	Xylenes (total)	5	U		ppb
699-48-77A	22-Feb-93	B08702	cis-1,2-Dichloroethylene	1	U		ppb
699-48-77A	22-Feb-93	B08702	gamma-BHC (Lindane)	0.05	U		ppb
699-48-77A	22-Feb-93	B08702	m-Cresol	10	U		ppb
699-48-77A	22-Feb-93	B08702	trans-1,2-Dichloroethylene	1	U		ppb
699-48-77A	22-Feb-93	B08703	Total organic carbon	1000	U		ppb
699-48-77A	22-Feb-93	B08703	Total organic halogen	10	U		ppb
699-48-77A	22-Feb-93	B08704	Total organic carbon	1000	U		ppb
699-48-77A	22-Feb-93	B08704	Total organic halogen	10	U		ppb
699-48-77A	22-Feb-93	B08705	Total organic carbon	1000	U		ppb
699-48-77A	22-Feb-93	B08705	Total organic halogen	10	U		ppb
699-48-77A	17-May-93	B08JD2	1,1,1-Trichloroethane	0.5	U		ppb
699-48-77A	17-May-93	B08JD2	1,1,2-Trichloroethane	0.5	U		ppb
699-48-77A	17-May-93	B08JD2	1,1-Dichloroethane	1	U		ppb
699-48-77A	17-May-93	B08JD2	1,2-Dichloroethane	0.5	U		ppb
699-48-77A	17-May-93	B08JD2	1,4-Dichlorobenzene	2	U		ppb
699-48-77A	17-May-93	B08JD2	2,4-Dichlorophenol	2.8	U		ppb
699-48-77A	17-May-93	B08JD2	2-Methylphenol	1.8	U		ppb
699-48-77A	17-May-93	B08JD2	2-Nitrophenol	3.96	U		ppb
699-48-77A	17-May-93	B08JD2	4,4'-DDD	0.1	U		ppb
699-48-77A	17-May-93	B08JD2	4,4'-DDE	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	4,4'-DDT	0.1	U		ppb
699-48-77A	17-May-93	B08JD2	4-Methylphenol	3.54	U		ppb
699-48-77A	17-May-93	B08JD2	Aldrin	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	Alpha-BHC	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	Benzene	2	U		ppb
699-48-77A	17-May-93	B08JD2	Benzothiazole	2.55	U		ppb
699-48-77A	17-May-93	B08JD2	Beta-BHC	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	Bis(2-ethylhexyl) phthalate	4.07	U		ppb
699-48-77A	17-May-93	B08JD2	Carbon tetrachloride	1	U		ppb
699-48-77A	17-May-93	B08JD2	Chlordane	0.1	U		ppb
699-48-77A	17-May-93	B08JD2	Chloroform	0.5	U		ppb
699-48-77A	17-May-93	B08JD2	Decane	4.03	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-May-93	B08JD2	Delta-BHC	0.1	U		ppb
699-48-77A	17-May-93	B08JD2	Dieldrin	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	Dodecane	3.62	U		ppb
699-48-77A	17-May-93	B08JD2	Endosulfan I	0.1	U		ppb
699-48-77A	17-May-93	B08JD2	Endosulfan II	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	Endosulfan sulfate	0.5	U		ppb
699-48-77A	17-May-93	B08JD2	Endrin	0.1	U		ppb
699-48-77A	17-May-93	B08JD2	Endrin Aldehyde	0.2	U		ppb
699-48-77A	17-May-93	B08JD2	Ethylbenzene	2	U		ppb
699-48-77A	17-May-93	B08JD2	Heptachlor	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	Heptachlor epoxide	1	U		ppb
699-48-77A	17-May-93	B08JD2	Methoxychlor	2	U		ppb
699-48-77A	17-May-93	B08JD2	Methylene chloride	5	U		ppb
699-48-77A	17-May-93	B08JD2	Naphthalene	6.5	U		ppb
699-48-77A	17-May-93	B08JD2	Pentachlorophenol	8.07	U		ppb
699-48-77A	17-May-93	B08JD2	Phenol	0.833	U		ppb
699-48-77A	17-May-93	B08JD2	Tetrachloroethene	0.5	U		ppb
699-48-77A	17-May-93	B08JD2	Tetradecane	2.43	U		ppb
699-48-77A	17-May-93	B08JD2	Toluene	2	U		ppb
699-48-77A	17-May-93	B08JD2	Total organic carbon	400	L		ppb
699-48-77A	17-May-93	B08JD2	Total organic halogen	10	U		ppb
699-48-77A	17-May-93	B08JD2	Toxaphene	2	U		ppb
699-48-77A	17-May-93	B08JD2	Tributyl Phosphate	4.42	U		ppb
699-48-77A	17-May-93	B08JD2	Trichloroethene	1	U		ppb
699-48-77A	17-May-93	B08JD2	Tris-2-chloroethyl phosphate	2.88	U		ppb
699-48-77A	17-May-93	B08JD2	Vinyl chloride	2	U		ppb
699-48-77A	17-May-93	B08JD2	Xylenes (total)	5	U		ppb
699-48-77A	17-May-93	B08JD2	cis-1,2-Dichloroethylene	1.38	L		ppb
699-48-77A	17-May-93	B08JD2	gamma-BHC (Lindane)	0.05	U		ppb
699-48-77A	17-May-93	B08JD2	m-Cresol	1.44	U		ppb
699-48-77A	17-May-93	B08JD2	trans-1,2-Dichloroethylene	0	U		
699-48-77A	17-May-93	B08JD3	Total organic carbon	500	L		ppb
699-48-77A	17-May-93	B08JD3	Total organic halogen	10	U		ppb
699-48-77A	17-May-93	B08JD4	Total organic carbon	600	L		ppb
699-48-77A	17-May-93	B08JD4	Total organic halogen	10	U		ppb
699-48-77A	17-May-93	B08JD5	Total organic carbon	400	L		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-May-93	B08JD5	Total organic halogen	10	U		ppb
699-48-77A	02-Sep-93	B090T6	1,1,1-Trichloroethane	0.072	U		ppb
699-48-77A	02-Sep-93	B090T6	1,1,2-Trichloroethane	0.043	U		ppb
699-48-77A	02-Sep-93	B090T6	1,1-Dichloroethane	0.337	U		ppb
699-48-77A	02-Sep-93	B090T6	1,2-Dichloroethane	0.139	U		ppb
699-48-77A	02-Sep-93	B090T6	1,4-Dichlorobenzene	0.107	U		ppb
699-48-77A	02-Sep-93	B090T6	2,4-Dichlorophenol	2.8	U		ppb
699-48-77A	02-Sep-93	B090T6	2-Methylphenol	1.8	U		ppb
699-48-77A	02-Sep-93	B090T6	2-Nitrophenol	3.96	U		ppb
699-48-77A	02-Sep-93	B090T6	4,4'-DDD	0.001	U		ppb
699-48-77A	02-Sep-93	B090T6	4,4'-DDE	0.001	U		ppb
699-48-77A	02-Sep-93	B090T6	4,4'-DDT	0.011	U		ppb
699-48-77A	02-Sep-93	B090T6	4-Methylphenol	3.54	U		ppb
699-48-77A	02-Sep-93	B090T6	Aldrin	0.05	U		ppb
699-48-77A	02-Sep-93	B090T6	Alpha-BHC	0.012	U		ppb
699-48-77A	02-Sep-93	B090T6	Benzene	0.105	U		ppb
699-48-77A	02-Sep-93	B090T6	Benzothiazole	2.55	U		ppb
699-48-77A	02-Sep-93	B090T6	Beta-BHC	0.003	U		ppb
699-48-77A	02-Sep-93	B090T6	Bis(2-ethylhexyl) phthalate	4.07	U		ppb
699-48-77A	02-Sep-93	B090T6	Carbon tetrachloride	0.121	U		ppb
699-48-77A	02-Sep-93	B090T6	Chlordane	0.006	U		ppb
699-48-77A	02-Sep-93	B090T6	Chloroform	0.043	U		ppb
699-48-77A	02-Sep-93	B090T6	Decane	4.03	U		ppb
699-48-77A	02-Sep-93	B090T6	Delta-BHC	0.001	U		ppb
699-48-77A	02-Sep-93	B090T6	Dieldrin	0.019	U		ppb
699-48-77A	02-Sep-93	B090T6	Dodecane	3.62	U		ppb
699-48-77A	02-Sep-93	B090T6	Endosulfan I	0.003	U		ppb
699-48-77A	02-Sep-93	B090T6	Endosulfan II	0.004	U		ppb
699-48-77A	02-Sep-93	B090T6	Endosulfan sulfate	0.007	U		ppb
699-48-77A	02-Sep-93	B090T6	Endrin	0.008	U		ppb
699-48-77A	02-Sep-93	B090T6	Endrin Aldehyde	0.011	U		ppb
699-48-77A	02-Sep-93	B090T6	Ethylbenzene	0.046	U		ppb
699-48-77A	02-Sep-93	B090T6	Heptachlor	0.002	U		ppb
699-48-77A	02-Sep-93	B090T6	Heptachlor epoxide	0.001	U		ppb
699-48-77A	02-Sep-93	B090T6	Methoxychlor	0.1	U		ppb
699-48-77A	02-Sep-93	B090T6	Methylene chloride	0.056	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	02-Sep-93	B090T6	Naphthalene	6.5	U		ppb
699-48-77A	02-Sep-93	B090T6	Pentachlorophenol	8.07	U		ppb
699-48-77A	02-Sep-93	B090T6	Phenol	0.833	U		ppb
699-48-77A	02-Sep-93	B090T6	Tetrachloroethene	0.049	U		ppb
699-48-77A	02-Sep-93	B090T6	Tetradecane	2.43	U		ppb
699-48-77A	02-Sep-93	B090T6	Toluene	0.056	U		ppb
699-48-77A	02-Sep-93	B090T6	Total organic carbon	400	L		ppb
699-48-77A	02-Sep-93	B090T6	Total organic halogen	8	U		ppb
699-48-77A	02-Sep-93	B090T6	Toxaphene	0.89	U		ppb
699-48-77A	02-Sep-93	B090T6	Tributyl Phosphate	4.42	U		ppb
699-48-77A	02-Sep-93	B090T6	Trichloroethene	0.065	U		ppb
699-48-77A	02-Sep-93	B090T6	Tris-2-chloroethyl phosphate	2.88	U		ppb
699-48-77A	02-Sep-93	B090T6	Vinyl chloride	0.266	U		ppb
699-48-77A	02-Sep-93	B090T6	Xylenes (total)	0.202	U		ppb
699-48-77A	02-Sep-93	B090T6	cis-1,2-Dichloroethylene	0.127	U		ppb
699-48-77A	02-Sep-93	B090T6	gamma-BHC (Lindane)	0.002	U		ppb
699-48-77A	02-Sep-93	B090T6	m-Cresol	1.44	XU		ppb
699-48-77A	02-Sep-93	B090T6	trans-1,2-Dichloroethylene	0.149	U		ppb
699-48-77A	02-Sep-93	B090T7	Total organic carbon	400	L		ppb
699-48-77A	02-Sep-93	B090T7	Total organic halogen	8	U		ppb
699-48-77A	02-Sep-93	B090T8	Total organic carbon	500	L		ppb
699-48-77A	02-Sep-93	B090T8	Total organic halogen	8	U		ppb
699-48-77A	02-Sep-93	B090T9	Total organic carbon	400	L		ppb
699-48-77A	02-Sep-93	B090T9	Total organic halogen	8	U		ppb
699-48-77A	15-Oct-93	B09B39	Total organic carbon	600	L		ppb
699-48-77A	15-Oct-93	B09B39	Total organic halogen	8	U		ppb
699-48-77A	15-Oct-93	B09B40	Total organic carbon	600	L		ppb
699-48-77A	15-Oct-93	B09B40	Total organic halogen	8	U		ppb
699-48-77A	15-Oct-93	B09B41	Total organic carbon	600	L		ppb
699-48-77A	15-Oct-93	B09B41	Total organic halogen	8	U		ppb
699-48-77A	15-Oct-93	B09B42	Total organic carbon	600	L		ppb
699-48-77A	15-Oct-93	B09B42	Total organic halogen	8	U		ppb
699-48-77A	17-Jan-94	B09Q40	Total organic carbon	400	L		ppb
699-48-77A	17-Jan-94	B09Q40	Total organic halogen	5	U		ppb
699-48-77A	17-Jan-94	B09Q41	Total organic carbon	400	L		ppb
699-48-77A	17-Jan-94	B09Q41	Total organic halogen	5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	17-Jan-94	B09Q42	Total organic carbon	400	L		ppb
699-48-77A	17-Jan-94	B09Q42	Total organic halogen	5	U		ppb
699-48-77A	17-Jan-94	B09Q43	Total organic carbon	400	L		ppb
699-48-77A	17-Jan-94	B09Q43	Total organic halogen	5	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4,5-T	0.018	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4,5-TP	0.015	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4,6-Trichlorophenol	1.45	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4-D	0.052	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4-Dichlorophenol	1.5	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4-Dimethylphenol	1.01	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,4-Dinitrophenol	0.96	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2,6-Dichlorophenol	1.59	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2-Chlorophenol	1.42	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2-Nitrophenol	1.56	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2-sec-Butyl-4,6-dinitrophenol(	0.24	U		ppb
699-48-77A	15-Apr-94	B0BRD9	2-sec-Butyl-4,6-dinitrophenol(	1.35	U		ppb
699-48-77A	15-Apr-94	B0BRD9	4,4'-DDD	0.004	U		ppb
699-48-77A	15-Apr-94	B0BRD9	4,4'-DDE	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRD9	4,4'-DDT	0.001	U		ppb
699-48-77A	15-Apr-94	B0BRD9	4,6-Dinitro-2-methylphenol	1.18	U		ppb
699-48-77A	15-Apr-94	B0BRD9	4-Chloro-3-methylphenol	1.12	U		ppb
699-48-77A	15-Apr-94	B0BRD9	4-Nitrophenol	0.65	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aldrin	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Alpha-BHC	0.003	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1016	0.059	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1221	0.06	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1232	0.094	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1242	0.17	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1248	0.047	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1254	0.092	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Aroclor-1260	0.079	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Beta-BHC	0.001	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Chlordane	0.042	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Cresols (methylphenols)	4.66	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Delta-BHC	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Dieldrin	0.002	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	15-Apr-94	B0BRD9	Endosulfan I	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Endosulfan II	0.001	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Endosulfan sulfate	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Endrin	0.004	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Endrin Aldehyde	0.004	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Heptachlor	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Heptachlor epoxide	0.001	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Methoxychlor	0.022	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Pentachlorophenol	0.87	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Phenol	0.31	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Tetrachlorophenols	1.05	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Total organic carbon	350	L		ppb
699-48-77A	15-Apr-94	B0BRD9	Total organic halogen	5	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Toxaphene	0.7	U		ppb
699-48-77A	15-Apr-94	B0BRD9	Trichlorophenols	1.11	U		ppb
699-48-77A	15-Apr-94	B0BRD9	gamma-BHC (Lindane)	0.002	U		ppb
699-48-77A	15-Apr-94	B0BRF0	Total organic carbon	500	L		ppb
699-48-77A	15-Apr-94	B0BRF0	Total organic halogen	5	U		ppb
699-48-77A	15-Apr-94	B0BRF1	Total organic carbon	400	L		ppb
699-48-77A	15-Apr-94	B0BRF1	Total organic halogen	5	U		ppb
699-48-77A	15-Apr-94	B0BRF2	Total organic carbon	400	L		ppb
699-48-77A	15-Apr-94	B0BRF2	Total organic halogen	7.5			ppb
699-48-77A	10-Aug-94	B0C754	2,4-Dichlorophenol	1.3	U		ppb
699-48-77A	10-Aug-94	B0C754	2-Methylphenol	1.9	U		ppb
699-48-77A	10-Aug-94	B0C754	2-Nitrophenol	1.6	U		ppb
699-48-77A	10-Aug-94	B0C754	4-Methylphenol	1.3	U		ppb
699-48-77A	10-Aug-94	B0C754	Benzothiazole	1.9	U		ppb
699-48-77A	10-Aug-94	B0C754	Bis(2-ethylhexyl) phthalate	1.1	U		ppb
699-48-77A	10-Aug-94	B0C754	Decane	2.9	U		ppb
699-48-77A	10-Aug-94	B0C754	Dodecane	2.4	U		ppb
699-48-77A	10-Aug-94	B0C754	Naphthalene	1.2	U		ppb
699-48-77A	10-Aug-94	B0C754	Pentachlorophenol	1.7	U		ppb
699-48-77A	10-Aug-94	B0C754	Phenol	0.5	U		ppb
699-48-77A	10-Aug-94	B0C754	Tetradecane	3	U		ppb
699-48-77A	10-Aug-94	B0C754	Total organic carbon	320	U		ppb
699-48-77A	10-Aug-94	B0C754	Total organic halogen	7.5			ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	10-Aug-94	B0C754	Tributyl Phosphate	3.9	U		ppb
699-48-77A	10-Aug-94	B0C754	Tris-2-chloroethyl phosphate	2.2	U		ppb
699-48-77A	10-Aug-94	B0C754	m-Cresol	6.3	XU		ppb
699-48-77A	10-Aug-94	B0C755	Total organic carbon	320	U		ppb
699-48-77A	10-Aug-94	B0C755	Total organic halogen	5.4			ppb
699-48-77A	10-Aug-94	B0C756	Total organic carbon	320	U		ppb
699-48-77A	10-Aug-94	B0C756	Total organic halogen	5	U		ppb
699-48-77A	10-Aug-94	B0C757	Total organic carbon	320	U		ppb
699-48-77A	10-Aug-94	B0C757	Total organic halogen	5	U		ppb
699-48-77A	27-Jul-95	B0FZ89	1,1,1-Trichloroethane	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	1,1,2-Trichloroethane	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	1,1-Dichloroethane	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	1,2-Dichloroethane	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	1,4-Dichlorobenzene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Benzene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Carbon tetrachloride	0.26	L		ppb
699-48-77A	27-Jul-95	B0FZ89	Chloroform	0.16	L		ppb
699-48-77A	27-Jul-95	B0FZ89	Ethylbenzene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Methylene chloride	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Tetrachloroethene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Toluene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Trichloroethene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Vinyl chloride	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	Xylenes (total)	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	cis-1,2-Dichloroethylene	0	U		ppb
699-48-77A	27-Jul-95	B0FZ89	trans-1,2-Dichloroethylene	0	U		ppb
699-48-77C	23-May-94	B0BTY4	1,1,1,2-Tetrachloroethane	0.29	U		ppb
699-48-77C	23-May-94	B0BTY4	1,1,1-Trichloroethane	0.58	U		ppb
699-48-77C	23-May-94	B0BTY4	1,1,2,2-Tetrachloroethane	1.1	U		ppb
699-48-77C	23-May-94	B0BTY4	1,1,2-Trichloroethane	0.16	U		ppb
699-48-77C	23-May-94	B0BTY4	1,1-Dichloroethane	0.082	U		ppb
699-48-77C	23-May-94	B0BTY4	1,1-Dichloroethene	0.63	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2,3-Trichloropropane	0.25	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2,4,5-Tetrachlorobenzene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2,4-Trichlorobenzene	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2-Dibromo-3-chloropropane	1.1	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	1,2-Dibromoethane	0.15	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2-Dichlorobenzene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2-Dichloroethane	0.15	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2-Dichloroethene	0.21	U		ppb
699-48-77C	23-May-94	B0BTY4	1,2-Dichloropropane	0.13	U		ppb
699-48-77C	23-May-94	B0BTY4	1,3-Dichlorobenzene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	1,4-Dichlorobenzene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	1,4-Dioxane	180	U		ppb
699-48-77C	23-May-94	B0BTY4	1,4-Naphtoquinone	0	U		ppb
699-48-77C	23-May-94	B0BTY4	1-Butanol	170	U		ppb
699-48-77C	23-May-94	B0BTY4	1-Naphthylamine	2.6	U		ppb
699-48-77C	23-May-94	B0BTY4	2,3,4,6-Tetrachlorophenol	1.7	U		ppb
699-48-77C	23-May-94	B0BTY4	2,3,7,8-TCDD	0.005	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4,5-T	0.018	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4,5-TP	0.015	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4,5-Trichlorophenol	2.7	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4,6-Trichlorophenol	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4,6-Trichlorophenol	2.9	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-D	0.052	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dichlorophenol	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dichlorophenol	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dimethylphenol	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dimethylphenol	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dinitrophenol	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dinitrophenol	2.3	U		ppb
699-48-77C	23-May-94	B0BTY4	2,4-Dinitrotoluene	1.9	U		ppb
699-48-77C	23-May-94	B0BTY4	2,6-Dichlorophenol	2.2	U		ppb
699-48-77C	23-May-94	B0BTY4	2,6-Dichlorophenol	8.2	U		ppb
699-48-77C	23-May-94	B0BTY4	2,6-Dinitrotoluene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Acetylaminofluorene	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Chloronaphthalene	3.5	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Chlorophenol	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Chlorophenol	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Hexanone	12	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Methylnaphthalene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Methylphenol	1.9	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	2-Naphthylamine	4.4	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Nitroaniline	2	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Nitrophenol	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Nitrophenol	1.7	U		ppb
699-48-77C	23-May-94	B0BTY4	2-Picoline	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	2-sec-Butyl-4,6-dinitrophenol(	0.24	U		ppb
699-48-77C	23-May-94	B0BTY4	2-sec-Butyl-4,6-dinitrophenol(	1.7	U		ppb
699-48-77C	23-May-94	B0BTY4	3,3'-Dichlorobenzidine	33.8	U		ppb
699-48-77C	23-May-94	B0BTY4	3,3'-Dimethylbenzidine	3.7	U		ppb
699-48-77C	23-May-94	B0BTY4	3-Methylcholanthrene	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	3-Nitroaniline	2.3	U		ppb
699-48-77C	23-May-94	B0BTY4	4,4'-DDD	0.004	U		ppb
699-48-77C	23-May-94	B0BTY4	4,4'-DDE	0.002	L		ppb
699-48-77C	23-May-94	B0BTY4	4,4'-DDT	0.001	U		ppb
699-48-77C	23-May-94	B0BTY4	4,6-Dinitro-2-methylphenol	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	4,6-Dinitro-2-methylphenol	3.6	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Aminobiphenyl	2.4	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Bromophenylphenylether	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Chloro-3-methylphenol	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Chloro-3-methylphenol	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Chloroaniline	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Chlorophenylphenylether	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Methyl-2-pentanone	18	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Methylphenol	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Nitroaniline	7.4	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Nitrophenol	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Nitrophenol	3.2	U		ppb
699-48-77C	23-May-94	B0BTY4	4-Nitroquinoline-1-oxide	3	U		ppb
699-48-77C	23-May-94	B0BTY4	5-Nitro-o-toluidine	3.3	U		ppb
699-48-77C	23-May-94	B0BTY4	7,12-Dimethylbenz[a]anthracene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Acenaphthene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Acenaphthylene	1.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Acetone	21	U		ppb
699-48-77C	23-May-94	B0BTY4	Acetonitrile	51	U		ppb
699-48-77C	23-May-94	B0BTY4	Acetophenone	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Acrolein	5.7	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	Acrylonitrile	0.93	U		ppb
699-48-77C	23-May-94	B0BTY4	Aldrin	0.003	L		ppb
699-48-77C	23-May-94	B0BTY4	Alpha-BHC	0.003	U		ppb
699-48-77C	23-May-94	B0BTY4	Aniline	1.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Anthracene	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Aramite	2.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzene	0.11	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzo(a)anthracene	1.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzo(a)pyrene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzo(b)fluoranthene	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzo(ghi)perylene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzo(k)fluoranthene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzothiazole	1.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Benzyl alcohol	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Beta-BHC	0.001	U		ppb
699-48-77C	23-May-94	B0BTY4	Bis(2-Choroethoxy)methane	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Bis(2-chloroethyl) ether	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Bis(2-chloroisopropyl) ether	1.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Bis(2-ethylhexyl) phthalate	1.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Bromodichloromethane	0.16	U		ppb
699-48-77C	23-May-94	B0BTY4	Bromoform	0.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Butylbenzylphthalate	2.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Carbon disulfide	0.45	U		ppb
699-48-77C	23-May-94	B0BTY4	Carbon tetrachloride	4.2	L		ppb
699-48-77C	23-May-94	B0BTY4	Chlordane	0.042	U		ppb
699-48-77C	23-May-94	B0BTY4	Chlorobenzene	0.11	U		ppb
699-48-77C	23-May-94	B0BTY4	Chlorobenzilate	5.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Chloroethane	0.13	U		ppb
699-48-77C	23-May-94	B0BTY4	Chloroform	0.81	L		ppb
699-48-77C	23-May-94	B0BTY4	Chloroprene	0.17	U		ppb
699-48-77C	23-May-94	B0BTY4	Chrysene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Cresols (methylphenols)	4.8	U		ppb
699-48-77C	23-May-94	B0BTY4	Delta-BHC	0.002	U		ppb
699-48-77C	23-May-94	B0BTY4	Di-n-butylphthalate	3	L		ppb
699-48-77C	23-May-94	B0BTY4	Di-n-octylphthalate	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Diallate	7.5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	Dibenz[a,h]anthracene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Dibenzofuran	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Dibromochloromethane	0.59	U		ppb
699-48-77C	23-May-94	B0BTY4	Dibromomethane	0.14	U		ppb
699-48-77C	23-May-94	B0BTY4	Dichlorodifluoromethane	2.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Dieldrin	0.002	U		ppb
699-48-77C	23-May-94	B0BTY4	Diethyl phthalate	5	U		ppb
699-48-77C	23-May-94	B0BTY4	Dimethoate	10	U		ppb
699-48-77C	23-May-94	B0BTY4	Dimethyl phthalate	3.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Diphenylamine	1.7	YU		ppb
699-48-77C	23-May-94	B0BTY4	Disulfoton	0.076	U		ppb
699-48-77C	23-May-94	B0BTY4	Endosulfan I	0.002	U		ppb
699-48-77C	23-May-94	B0BTY4	Endosulfan II	0.001	U		ppb
699-48-77C	23-May-94	B0BTY4	Endosulfan sulfate	0.002	U		ppb
699-48-77C	23-May-94	B0BTY4	Endrin	0.004	U		ppb
699-48-77C	23-May-94	B0BTY4	Endrin Aldehyde	0.004	U		ppb
699-48-77C	23-May-94	B0BTY4	Ethyl cyanide	3	U		ppb
699-48-77C	23-May-94	B0BTY4	Ethyl methacrylate	0.55	U		ppb
699-48-77C	23-May-94	B0BTY4	Ethyl methanesulfonate	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Ethylbenzene	0.21	U		ppb
699-48-77C	23-May-94	B0BTY4	Famphur	3.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Fluoranthene	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Fluorene	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Heptachlor	0.002	U		ppb
699-48-77C	23-May-94	B0BTY4	Heptachlor epoxide	0.001	U		ppb
699-48-77C	23-May-94	B0BTY4	Hexachlorobenzene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Hexachlorobutadiene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Hexachlorocyclopentadiene	2.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Hexachloroethane	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	Hexachlorophene	6.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Hexachloropropene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Indeno(1,2,3-cd)pyrene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Isobutyl alcohol	200	U		ppb
699-48-77C	23-May-94	B0BTY4	Isodrin	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Isophorone	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Isosafrole	4.5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	Kepone	4.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Kerosene	7.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Methacrylonitrile	0.58	U		ppb
699-48-77C	23-May-94	B0BTY4	Methapyrilene	2.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Methoxychlor	0.022	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl Iodide	0.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl bromide	0.57	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl chloride	0.15	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl ethyl ketone	20	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl methacrylate	0.26	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl methanesulfonate	1.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Methyl parathion	0.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Methylene chloride	1.3	BL		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitroso-di-n-dipropylamine	2	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosodi-n-butylamine	5.5	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosodiethylamine	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosodimethylamine	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosodiphenylamine	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosomethylethylamine	1.1	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosomorpholine	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	N-Nitrosopiperidine	3.8	U		ppb
699-48-77C	23-May-94	B0BTY4	Naphthalene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Nitrobenzene	1.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Nitrosopyrrolidine	1.5	U		ppb
699-48-77C	23-May-94	B0BTY4	O,O,O-Triethyl phosphorothioat	1.9	U		ppb
699-48-77C	23-May-94	B0BTY4	O,O-diethylO-2-pyrazinylphosp	2.7	U		ppb
699-48-77C	23-May-94	B0BTY4	PCDDs	0.091	U		ppb
699-48-77C	23-May-94	B0BTY4	PCDFs	0.11	U		ppb
699-48-77C	23-May-94	B0BTY4	Parathion	2.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Pentachlorobenzene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Pentachloroethane	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Pentachloronitrobenzene(PCNB)	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	Pentachlorophenol	1.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Phenacetin	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	Phenanthrene	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Phenol	0.5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	Phenol	0.57	U		ppb
699-48-77C	23-May-94	B0BTY4	Phorate	0.033	U		ppb
699-48-77C	23-May-94	B0BTY4	Pronamide	4.5	U		ppb
699-48-77C	23-May-94	B0BTY4	Pyrene	1.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Pyridine	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Safrol	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Styrene	0.081	U		ppb
699-48-77C	23-May-94	B0BTY4	Tetrachloroethene	0.13	U		ppb
699-48-77C	23-May-94	B0BTY4	Tetrachlorophenols	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	Tetraethyldithiopyrophosphate	2.6	U		ppb
699-48-77C	23-May-94	B0BTY4	Tetrahydrofuran	2.8	U		ppb
699-48-77C	23-May-94	B0BTY4	Toluene	0.12	U		ppb
699-48-77C	23-May-94	B0BTY4	Total organic carbon	320	U		ppb
699-48-77C	23-May-94	B0BTY4	Total organic halogen	6.9			ppb
699-48-77C	23-May-94	B0BTY4	Toxaphene	0.7	U		ppb
699-48-77C	23-May-94	B0BTY4	Tributyl Phosphate	3.9	U		ppb
699-48-77C	23-May-94	B0BTY4	Trichloroethene	0.11	U		ppb
699-48-77C	23-May-94	B0BTY4	Trichloromonofluoromethane	1.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Trichlorophenols	2.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Tris-2-chloroethyl phosphate	2.2	U		ppb
699-48-77C	23-May-94	B0BTY4	Vinyl acetate	3.1	U		ppb
699-48-77C	23-May-94	B0BTY4	Vinyl chloride	0.14	U		ppb
699-48-77C	23-May-94	B0BTY4	Xylenes (total)	0.17	U		ppb
699-48-77C	23-May-94	B0BTY4	allylchloride	0.27	U		ppb
699-48-77C	23-May-94	B0BTY4	alpha,alpha-Dimethylphenethyla	7.5	U		ppb
699-48-77C	23-May-94	B0BTY4	cis-1,3-Dichloropropene	0.16	U		ppb
699-48-77C	23-May-94	B0BTY4	gamma-BHC (Lindane)	0.002	U		ppb
699-48-77C	23-May-94	B0BTY4	m-Cresol	6.3	XU		ppb
699-48-77C	23-May-94	B0BTY4	m-dinitrobenzene	1.3	U		ppb
699-48-77C	23-May-94	B0BTY4	o-Toluidine	5.4	U		ppb
699-48-77C	23-May-94	B0BTY4	p-Dimethylaminoazobenzene	1.4	U		ppb
699-48-77C	23-May-94	B0BTY4	p-Phenylenediamine	2.6	U		ppb
699-48-77C	23-May-94	B0BTY4	sym-Trinitrobenzene	3.2	U		ppb
699-48-77C	23-May-94	B0BTY4	trans-1,3-Dichloropropene	1.8	U		ppb
699-48-77C	23-May-94	B0BTY4	trans-1,4-dichloro-2-butene	0.53	U		ppb
699-48-77C	23-May-94	B0BTY5	Total organic carbon	320	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY5	Total organic halogen	7.2			ppb
699-48-77C	23-May-94	B0BTY6	Total organic carbon	320	U		ppb
699-48-77C	23-May-94	B0BTY6	Total organic halogen	11.4			ppb
699-48-77C	23-May-94	B0BTY7	Total organic carbon	320	U		ppb
699-48-77C	23-May-94	B0BTY7	Total organic halogen	19.1			ppb
699-48-77C	10-Aug-94	B0C7N8	1,1,1,2-Tetrachloroethane	0.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,1,1-Trichloroethane	0.28	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,1,2,2-Tetrachloroethane	0.23	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,1,2-Trichloroethane	0.23	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,1-Dichloroethane	0.14	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,1-Dichloroethene	0.36	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2,3-Trichloropropane	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2,4,5-Tetrachlorobenzene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2,4-Trichlorobenzene	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2-Dibromo-3-chloropropane	3.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2-Dibromoethane	0.13	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2-Dichlorobenzene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2-Dichloroethane	0.29	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2-Dichloroethene	0.65	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,2-Dichloropropane	0.19	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,3-Dichlorobenzene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,4-Dichlorobenzene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,4-Dioxane	88	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1,4-Naphthoquinone	0	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1-Butanol	76	U		ppb
699-48-77C	10-Aug-94	B0C7N8	1-Naphthylamine	2.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,3,4,6-Tetrachlorophenol	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,3,7,8-TCDD	0.005	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4,5-T	0.018	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4,5-TP	0.015	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4,5-Trichlorophenol	2.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4,6-Trichlorophenol	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4,6-Trichlorophenol	2.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-D	0.052	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-Dichlorophenol	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-Dichlorophenol	1.5	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	2,4-Dimethylphenol	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-Dimethylphenol	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-Dinitrophenol	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-Dinitrophenol	2.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,4-Dinitrotoluene	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,6-Dichlorophenol	2.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,6-Dichlorophenol	8.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2,6-Dinitrotoluene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Acetylaminofluorene	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Chloronaphthalene	3.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Chlorophenol	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Chlorophenol	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Hexanone	0.52	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Methylnaphthalene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Methylphenol	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Naphthylamine	4.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Nitroaniline	2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Nitrophenol	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Nitrophenol	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-Picoline	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-sec-Butyl-4,6-dinitrophenol(	0.24	U		ppb
699-48-77C	10-Aug-94	B0C7N8	2-sec-Butyl-4,6-dinitrophenol(	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	3,3'-Dichlorobenzidine	33.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	3,3'-Dimethylbenzidine	3.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	3-Methylcholanthrene	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	3-Nitroaniline	2.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4,4'-DDD	0.004	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4,4'-DDE	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4,4'-DDT	0.001	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4,6-Dinitro-2-methylphenol	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4,6-Dinitro-2-methylphenol	3.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Aminobiphenyl	2.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Bromophenylphenylether	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Chloro-3-methylphenol	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Chloro-3-methylphenol	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Chloroaniline	1.2	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	4-Chlorophenylphenylether	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Methyl-2-pentanone	18	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Methylphenol	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Nitroaniline	7.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Nitrophenol	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Nitrophenol	3.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	4-Nitroquinoline-1-oxide	3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	5-Nitro-o-toluidine	3.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	7,12-Dimethylbenz[a]anthracene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acenaphthene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acenaphthylene	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acetone	2.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acetonitrile	2.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acetophenone	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acrolein	6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Acrylonitrile	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Aldrin	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Alpha-BHC	0.003	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Aniline	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Anthracene	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Aramite	2.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzene	0.14	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzo(a)anthracene	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzo(a)pyrene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzo(b)fluoranthene	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzo(ghi)perylene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzo(k)fluoranthene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzothiazole	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Benzyl alcohol	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Beta-BHC	0.001	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bis(2-Choroethoxy)methane	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bis(2-chloroethyl) ether	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bis(2-chloroisopropyl) ether	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bis(2-ethylhexyl) phthalate	1.1	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bromodichloromethane	0.61	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Bromoform	0.26	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	Butylbenzylphthalate	2.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Carbon disulfide	0.32	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Carbon tetrachloride	4.4	L		ppb
699-48-77C	10-Aug-94	B0C7N8	Chlordane	0.042	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Chlorobenzene	0.16	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Chlorobenzilate	5.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Chloroethane	0.45	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Chloroform	0.76	L		ppb
699-48-77C	10-Aug-94	B0C7N8	Chloroprene	0.61	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Chrysene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Cresols (methylphenols)	4.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Delta-BHC	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Di-n-butylphthalate	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Di-n-octylphthalate	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Diallate	7.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dibenz[a,h]anthracene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dibenzofuran	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dibromochloromethane	0.16	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dibromomethane	0.15	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dichlorodifluoromethane	0.45	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dieldrin	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Diethyl phthalate	5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dimethoate	10	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Dimethyl phthalate	3.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Diphenylamine	1.7	YU		ppb
699-48-77C	10-Aug-94	B0C7N8	Disulfoton	0.076	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Endosulfan I	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Endosulfan II	0.001	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Endosulfan sulfate	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Endrin	0.004	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Endrin Aldehyde	0.004	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Ethyl cyanide	3.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Ethyl methacrylate	0.18	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Ethyl methanesulfonate	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Ethylbenzene	0.32	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Famphur	3.4	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	Fluoranthene	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Fluorene	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Heptachlor	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Heptachlor epoxide	0.001	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Hexachlorobenzene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Hexachlorobutadiene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Hexachlorocyclopentadiene	2.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Hexachloroethane	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Hexachlorophene	6.1	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Hexachloropropene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Indeno(1,2,3-cd)pyrene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Isobutyl alcohol	58	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Isodrin	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Isophorone	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Isosafrole	4.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Kepone	4.1	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Kerosene	7.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methacrylonitrile	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methapyrilene	2.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methoxychlor	0.022	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl Iodide	0.14	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl bromide	0.31	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl chloride	0.43	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl ethyl ketone	14	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl methacrylate	0.41	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl methanesulfonate	1.1	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methyl parathion	0.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Methylene chloride	0.68	BL		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitroso-di-n-dipropylamine	2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosodi-n-butylamine	5.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosodiethylamine	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosodimethylamine	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosodiphenylamine	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosomethylethylamine	1.1	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosomorpholine	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	N-Nitrosopiperidine	3.8	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	Naphthalene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Nitrobenzene	1.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Nitrosopyrrolidine	1.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	O,O,O-Triethyl phosphorothioat	1.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	O,O-diethylO-2-pyrazinyl phosp	2.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	PCDDs	0.091	U		ppb
699-48-77C	10-Aug-94	B0C7N8	PCDFs	0.11	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Parathion	2.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pentachlorobenzene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pentachloroethane	0.51	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pentachloronitrobenzene (PCNB)	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pentachlorophenol	1.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Phenacetin	1.8	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Phenanthrene	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Phenol	0.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Phenol	0.57	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Phorate	0.033	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pronamide	4.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pyrene	1.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Pyridine	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Safrol	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Styrene	0.55	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Tetrachloroethene	0.38	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Tetrachlorophenols	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Tetraethyldithiopyrophosphate	2.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Tetrahydrofuran	4.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Toluene	0.23	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Total organic carbon	320	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Total organic halogen	8			ppb
699-48-77C	10-Aug-94	B0C7N8	Toxaphene	0.7	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Tributyl Phosphate	3.9	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Trichloroethene	0.27	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Trichloromonofluoromethane	0.21	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Trichlorophenols	2.1	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Tris-2-chloroethyl phosphate	2.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Vinyl acetate	2.7	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	10-Aug-94	B0C7N8	Vinyl chloride	0.39	U		ppb
699-48-77C	10-Aug-94	B0C7N8	Xylenes (total)	0.45	U		ppb
699-48-77C	10-Aug-94	B0C7N8	allylchloride	0.42	U		ppb
699-48-77C	10-Aug-94	B0C7N8	alpha,alpha-Dimethylphenethyla	7.5	U		ppb
699-48-77C	10-Aug-94	B0C7N8	cis-1,3-Dichloropropene	0.17	U		ppb
699-48-77C	10-Aug-94	B0C7N8	gamma-BHC (Lindane)	0.002	U		ppb
699-48-77C	10-Aug-94	B0C7N8	m-Cresol	6.3	XU		ppb
699-48-77C	10-Aug-94	B0C7N8	m-dinitrobenzene	1.3	U		ppb
699-48-77C	10-Aug-94	B0C7N8	o-Toluidine	5.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	p-Dimethylaminoazobenzene	1.4	U		ppb
699-48-77C	10-Aug-94	B0C7N8	p-Phenylenediamine	2.6	U		ppb
699-48-77C	10-Aug-94	B0C7N8	sym-Trinitrobenzene	3.2	U		ppb
699-48-77C	10-Aug-94	B0C7N8	trans-1,3-Dichloropropene	0.16	U		ppb
699-48-77C	10-Aug-94	B0C7N8	trans-1,4-dichloro-2-butene	2.2	U		ppb
699-48-77C	10-Aug-94	B0C7N9	Total organic carbon	320	U		ppb
699-48-77C	10-Aug-94	B0C7N9	Total organic halogen	8.1			ppb
699-48-77C	10-Aug-94	B0C7P0	Total organic carbon	320	U		ppb
699-48-77C	10-Aug-94	B0C7P0	Total organic halogen	20			ppb
699-48-77C	10-Aug-94	B0C7P1	Total organic carbon	320	U		ppb
699-48-77C	10-Aug-94	B0C7P1	Total organic halogen	10.3			ppb
699-48-77D	23-May-94	B0BTY9	1,1,1,2-Tetrachloroethane	0.29	U		ppb
699-48-77D	23-May-94	B0BTY9	1,1,1-Trichloroethane	1.1	L		ppb
699-48-77D	23-May-94	B0BTY9	1,1,2,2-Tetrachloroethane	1.1	U		ppb
699-48-77D	23-May-94	B0BTY9	1,1,2-Trichloroethane	0.16	U		ppb
699-48-77D	23-May-94	B0BTY9	1,1-Dichloroethane	0.082	U		ppb
699-48-77D	23-May-94	B0BTY9	1,1-Dichloroethene	0.63	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2,3-Trichloropropane	0.25	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2,4,5-Tetrachlorobenzene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2,4-Trichlorobenzene	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2-Dibromo-3-chloropropane	1.1	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2-Dibromoethane	0.15	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2-Dichlorobenzene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2-Dichloroethane	0.15	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2-Dichloroethene	0.21	U		ppb
699-48-77D	23-May-94	B0BTY9	1,2-Dichloropropane	0.13	U		ppb
699-48-77D	23-May-94	B0BTY9	1,3-Dichlorobenzene	1.3	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	1,4-Dichlorobenzene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	1,4-Dioxane	180	U		ppb
699-48-77D	23-May-94	B0BTY9	1,4-Naphtoquinone	0	U		ppb
699-48-77D	23-May-94	B0BTY9	1-Butanol	170	U		ppb
699-48-77D	23-May-94	B0BTY9	1-Naphthylamine	2.6	U		ppb
699-48-77D	23-May-94	B0BTY9	2,3,4,6-Tetrachlorophenol	1.7	U		ppb
699-48-77D	23-May-94	B0BTY9	2,3,7,8-TCDD	0.005	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4,5-T	0.018	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4,5-TP	0.015	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4,5-Trichlorophenol	2.7	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4,6-Trichlorophenol	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4,6-Trichlorophenol	2.9	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-D	0.052	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dichlorophenol	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dichlorophenol	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dimethylphenol	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dimethylphenol	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dinitrophenol	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dinitrophenol	2.3	U		ppb
699-48-77D	23-May-94	B0BTY9	2,4-Dinitrotoluene	1.9	U		ppb
699-48-77D	23-May-94	B0BTY9	2,6-Dichlorophenol	2.2	U		ppb
699-48-77D	23-May-94	B0BTY9	2,6-Dichlorophenol	8.2	U		ppb
699-48-77D	23-May-94	B0BTY9	2,6-Dinitrotoluene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Acetylaminofluorene	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Chloronaphthalene	3.5	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Chlorophenol	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Chlorophenol	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Hexanone	12	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Methylnaphthalene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Methylphenol	1.9	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Naphthylamine	4.4	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Nitroaniline	2	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Nitrophenol	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Nitrophenol	1.7	U		ppb
699-48-77D	23-May-94	B0BTY9	2-Picoline	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	2-sec-Butyl-4,6-dinitrophenol(	0.24	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	2-sec-Butyl-4,6-dinitrophenol(	1.7	U		ppb
699-48-77D	23-May-94	B0BTY9	3,3'-Dichlorobenzidine	33.8	U		ppb
699-48-77D	23-May-94	B0BTY9	3,3'-Dimethylbenzidine	3.7	U		ppb
699-48-77D	23-May-94	B0BTY9	3-Methylcholanthrene	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	3-Nitroaniline	2.3	U		ppb
699-48-77D	23-May-94	B0BTY9	4,4'-DDD	0.004	U		ppb
699-48-77D	23-May-94	B0BTY9	4,4'-DDE	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	4,4'-DDT	0.001	U		ppb
699-48-77D	23-May-94	B0BTY9	4,6-Dinitro-2-methylphenol	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	4,6-Dinitro-2-methylphenol	3.6	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Aminobiphenyl	2.4	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Bromophenylphenylether	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Chloro-3-methylphenol	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Chloro-3-methylphenol	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Chloroaniline	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Chlorophenylphenylether	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Methyl-2-pentanone	18	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Methylphenol	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Nitroaniline	7.4	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Nitrophenol	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Nitrophenol	3.2	U		ppb
699-48-77D	23-May-94	B0BTY9	4-Nitroquinoline-1-oxide	3	U		ppb
699-48-77D	23-May-94	B0BTY9	5-Nitro-o-toluidine	3.3	U		ppb
699-48-77D	23-May-94	B0BTY9	7,12-Dimethylbenz[a]anthracene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Acenaphthene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Acenaphthylene	1.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Acetone	21	U		ppb
699-48-77D	23-May-94	B0BTY9	Acetonitrile	51	U		ppb
699-48-77D	23-May-94	B0BTY9	Acetophenone	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Acrolein	5.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Acrylonitrile	0.93	U		ppb
699-48-77D	23-May-94	B0BTY9	Aldrin	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	Alpha-BHC	0.003	U		ppb
699-48-77D	23-May-94	B0BTY9	Aniline	1.9	U		ppb
699-48-77D	23-May-94	B0BTY9	Anthracene	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Aramite	2.9	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	Benzene	0.11	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzo(a)anthracene	1.9	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzo(a)pyrene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzo(b)fluoranthene	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzo(ghi)perylene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzo(k)fluoranthene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzothiazole	1.9	U		ppb
699-48-77D	23-May-94	B0BTY9	Benzyl alcohol	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Beta-BHC	0.001	U		ppb
699-48-77D	23-May-94	B0BTY9	Bis(2-Choroethoxy)methane	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Bis(2-chloroethyl) ether	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Bis(2-chloroisopropyl) ether	1.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Bis(2-ethylhexyl) phthalate	1.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Bromodichloromethane	0.16	U		ppb
699-48-77D	23-May-94	B0BTY9	Bromoform	0.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Butylbenzylphthalate	2.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Carbon disulfide	0.45	U		ppb
699-48-77D	23-May-94	B0BTY9	Carbon tetrachloride	1.8	L		ppb
699-48-77D	23-May-94	B0BTY9	Chlordane	0.042	U		ppb
699-48-77D	23-May-94	B0BTY9	Chlorobenzene	0.11	U		ppb
699-48-77D	23-May-94	B0BTY9	Chlorobenzilate	5.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Chloroethane	0.13	U		ppb
699-48-77D	23-May-94	B0BTY9	Chloroform	0.79	L		ppb
699-48-77D	23-May-94	B0BTY9	Chloroprene	0.17	U		ppb
699-48-77D	23-May-94	B0BTY9	Chrysene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Cresols (methylphenols)	4.8	U		ppb
699-48-77D	23-May-94	B0BTY9	Delta-BHC	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	Di-n-butylphthalate	2.9	L		ppb
699-48-77D	23-May-94	B0BTY9	Di-n-octylphthalate	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Diallate	7.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Dibenz[a,h]anthracene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Dibenzofuran	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Dibromochloromethane	0.59	U		ppb
699-48-77D	23-May-94	B0BTY9	Dibromomethane	0.14	U		ppb
699-48-77D	23-May-94	B0BTY9	Dichlorodifluoromethane	2.9	U		ppb
699-48-77D	23-May-94	B0BTY9	Dieldrin	0.002	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	Diethyl phthalate	5	U		ppb
699-48-77D	23-May-94	B0BTY9	Dimethoate	10	U		ppb
699-48-77D	23-May-94	B0BTY9	Dimethyl phthalate	3.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Diphenylamine	1.7	YU		ppb
699-48-77D	23-May-94	B0BTY9	Disulfoton	0.076	U		ppb
699-48-77D	23-May-94	B0BTY9	Endosulfan I	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	Endosulfan II	0.001	U		ppb
699-48-77D	23-May-94	B0BTY9	Endosulfan sulfate	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	Endrin	0.004	U		ppb
699-48-77D	23-May-94	B0BTY9	Endrin Aldehyde	0.004	U		ppb
699-48-77D	23-May-94	B0BTY9	Ethyl cyanide	3	U		ppb
699-48-77D	23-May-94	B0BTY9	Ethyl methacrylate	0.55	U		ppb
699-48-77D	23-May-94	B0BTY9	Ethyl methanesulfonate	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Ethylbenzene	0.21	U		ppb
699-48-77D	23-May-94	B0BTY9	Famphur	3.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Fluoranthene	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Fluorene	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Heptachlor	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	Heptachlor epoxide	0.001	U		ppb
699-48-77D	23-May-94	B0BTY9	Hexachlorobenzene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Hexachlorobutadiene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Hexachlorocyclopentadiene	2.9	U		ppb
699-48-77D	23-May-94	B0BTY9	Hexachloroethane	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	Hexachlorophene	6.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Hexachloropropene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Indeno(1,2,3-cd)pyrene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Isobutyl alcohol	200	U		ppb
699-48-77D	23-May-94	B0BTY9	Isodrin	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Isophorone	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Isosafrole	4.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Kepone	4.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Kerosene	7.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Methacrylonitrile	0.58	U		ppb
699-48-77D	23-May-94	B0BTY9	Methapyrilene	2.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Methoxychlor	0.022	U		ppb
699-48-77D	23-May-94	B0BTY9	Methyl Iodide	0.1	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	Methyl bromide	0.57	U		ppb
699-48-77D	23-May-94	B0BTY9	Methyl chloride	0.15	U		ppb
699-48-77D	23-May-94	B0BTY9	Methyl ethyl ketone	20	U		ppb
699-48-77D	23-May-94	B0BTY9	Methyl methacrylate	0.26	U		ppb
699-48-77D	23-May-94	B0BTY9	Methyl methanesulfonate	1.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Methyl parathion	0.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Methylene chloride	1.4	BL		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitroso-di-n-dipropylamine	2	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosodi-n-butylamine	5.5	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosodiethylamine	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosodimethylamine	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosodiphenylamine	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosomethylethylamine	1.1	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosomorpholine	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	N-Nitrosopiperidine	3.8	U		ppb
699-48-77D	23-May-94	B0BTY9	Naphthalene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Nitrobenzene	1.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Nitrosopyrrolidine	1.5	U		ppb
699-48-77D	23-May-94	B0BTY9	O,O,O-Triethyl phosphorothioat	1.9	U		ppb
699-48-77D	23-May-94	B0BTY9	O,O-diethylO-2-pyrazinylphosp	2.7	U		ppb
699-48-77D	23-May-94	B0BTY9	PCDDs	0.091	U		ppb
699-48-77D	23-May-94	B0BTY9	PCDFs	0.11	U		ppb
699-48-77D	23-May-94	B0BTY9	Parathion	2.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Pentachlorobenzene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Pentachloroethane	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Pentachloronitrobenzene(PCNB)	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	Pentachlorophenol	1.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Phenacetin	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	Phenanthrene	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Phenol	0.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Phenol	0.57	U		ppb
699-48-77D	23-May-94	B0BTY9	Phorate	0.033	U		ppb
699-48-77D	23-May-94	B0BTY9	Pronamide	4.5	U		ppb
699-48-77D	23-May-94	B0BTY9	Pyrene	1.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Pyridine	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Safrol	1.4	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	23-May-94	B0BTY9	Styrene	0.081	U		ppb
699-48-77D	23-May-94	B0BTY9	Tetrachloroethene	0.13	U		ppb
699-48-77D	23-May-94	B0BTY9	Tetrachlorophenols	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	Tetraethyldithiopyrophosphate	2.6	U		ppb
699-48-77D	23-May-94	B0BTY9	Tetrahydrofuran	2.8	U		ppb
699-48-77D	23-May-94	B0BTY9	Toluene	0.12	U		ppb
699-48-77D	23-May-94	B0BTY9	Total organic carbon	320	U		ppb
699-48-77D	23-May-94	B0BTY9	Total organic halogen	15			ppb
699-48-77D	23-May-94	B0BTY9	Toxaphene	0.7	U		ppb
699-48-77D	23-May-94	B0BTY9	Tributyl Phosphate	3.9	U		ppb
699-48-77D	23-May-94	B0BTY9	Trichloroethene	0.11	U		ppb
699-48-77D	23-May-94	B0BTY9	Trichloromonofluoromethane	1.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Trichlorophenols	2.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Tris-2-chloroethyl phosphate	2.2	U		ppb
699-48-77D	23-May-94	B0BTY9	Vinyl acetate	3.1	U		ppb
699-48-77D	23-May-94	B0BTY9	Vinyl chloride	0.14	U		ppb
699-48-77D	23-May-94	B0BTY9	Xylenes (total)	0.17	U		ppb
699-48-77D	23-May-94	B0BTY9	allylchloride	0.27	U		ppb
699-48-77D	23-May-94	B0BTY9	alpha,alpha-Dimethylphenethyla	7.5	U		ppb
699-48-77D	23-May-94	B0BTY9	cis-1,3-Dichloropropene	0.16	U		ppb
699-48-77D	23-May-94	B0BTY9	gamma-BHC (Lindane)	0.002	U		ppb
699-48-77D	23-May-94	B0BTY9	m-Cresol	6.3	XU		ppb
699-48-77D	23-May-94	B0BTY9	m-dinitrobenzene	1.3	U		ppb
699-48-77D	23-May-94	B0BTY9	o-Toluidine	5.4	U		ppb
699-48-77D	23-May-94	B0BTY9	p-Dimethylaminoazobenzene	1.4	U		ppb
699-48-77D	23-May-94	B0BTY9	p-Phenylenediamine	2.6	U		ppb
699-48-77D	23-May-94	B0BTY9	sym-Trinitrobenzene	3.2	U		ppb
699-48-77D	23-May-94	B0BTY9	trans-1,3-Dichloropropene	1.8	U		ppb
699-48-77D	23-May-94	B0BTY9	trans-1,4-dichloro-2-butene	0.53	U		ppb
699-48-77D	23-May-94	B0BTZ0	Total organic carbon	320	U		ppb
699-48-77D	23-May-94	B0BTZ0	Total organic halogen	17.5			ppb
699-48-77D	23-May-94	B0BTZ1	Total organic carbon	320	U		ppb
699-48-77D	23-May-94	B0BTZ1	Total organic halogen	12.7			ppb
699-48-77D	23-May-94	B0BTZ2	Total organic carbon	320	U		ppb
699-48-77D	23-May-94	B0BTZ2	Total organic halogen	18.7			ppb
699-48-77D	10-Aug-94	B0C7P3	1,1,1,2-Tetrachloroethane	0.2	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	1,1,1-Trichloroethane	0.28	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,1,2,2-Tetrachloroethane	0.23	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,1,2-Trichloroethane	0.23	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,1-Dichloroethane	0.14	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,1-Dichloroethene	0.36	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2,3-Trichloropropane	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2,4,5-Tetrachlorobenzene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2,4-Trichlorobenzene	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2-Dibromo-3-chloropropane	3.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2-Dibromoethane	0.13	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2-Dichlorobenzene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2-Dichloroethane	0.29	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2-Dichloroethene	0.65	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,2-Dichloropropane	0.19	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,3-Dichlorobenzene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,4-Dichlorobenzene	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,4-Dioxane	88	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1,4-Naphtoquinone	0	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1-Butanol	76	U		ppb
699-48-77D	10-Aug-94	B0C7P3	1-Naphthylamine	2.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,3,4,6-Tetrachlorophenol	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,3,7,8-TCDD	0.005	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4,5-T	0.018	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4,5-TP	0.015	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4,5-Trichlorophenol	2.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4,6-Trichlorophenol	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4,6-Trichlorophenol	2.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-D	0.052	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dichlorophenol	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dichlorophenol	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dimethylphenol	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dimethylphenol	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dinitrophenol	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dinitrophenol	2.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,4-Dinitrotoluene	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,6-Dichlorophenol	2.2	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	2,6-Dichlorophenol	8.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2,6-Dinitrotoluene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Acetylaminofluorene	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Chloronaphthalene	3.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Chlorophenol	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Chlorophenol	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Hexanone	0.52	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Methylnaphthalene	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Methylphenol	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Naphthylamine	4.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Nitroaniline	2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Nitrophenol	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Nitrophenol	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-Picoline	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-sec-Butyl-4,6-dinitrophenol(	0.24	U		ppb
699-48-77D	10-Aug-94	B0C7P3	2-sec-Butyl-4,6-dinitrophenol(	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	3,3'-Dichlorobenzidine	33.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	3,3'-Dimethylbenzidine	3.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	3-Methylcholanthrene	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	3-Nitroaniline	2.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4,4'-DDD	0.004	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4,4'-DDE	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4,4'-DDT	0.001	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4,6-Dinitro-2-methylphenol	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4,6-Dinitro-2-methylphenol	3.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Aminobiphenyl	2.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Bromophenylphenylether	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Chloro-3-methylphenol	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Chloro-3-methylphenol	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Chloroaniline	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Chlorophenylphenylether	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Methyl-2-pentanone	18	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Methylphenol	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Nitroaniline	7.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Nitrophenol	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	4-Nitrophenol	3.2	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	4-Nitroquinoline-1-oxide	3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	5-Nitro-o-toluidine	3.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	7,12-Dimethylbenz[a]anthracene	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acenaphthene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acenaphthylene	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acetone	2.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acetonitrile	2.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acetophenone	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acrolein	6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Acrylonitrile	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Aldrin	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Alpha-BHC	0.003	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Aniline	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Anthracene	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Aramite	2.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzene	0.14	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzo(a)anthracene	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzo(a)pyrene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzo(b)fluoranthene	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzo(ghi)perylene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzo(k)fluoranthene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzothiazole	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Benzyl alcohol	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Beta-BHC	0.001	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bis(2-Choroethoxy)methane	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bis(2-chloroethyl) ether	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bis(2-chloroisopropyl) ether	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bis(2-ethylhexyl) phthalate	1.1	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bromodichloromethane	0.61	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Bromoform	0.26	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Butylbenzylphthalate	2.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Carbon disulfide	0.32	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Carbon tetrachloride	2.4	L		ppb
699-48-77D	10-Aug-94	B0C7P3	Chlordane	0.042	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Chlorobenzene	0.16	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Chlorobenzilate	5.4	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	Chloroethane	0.45	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Chloroform	0.74	L		ppb
699-48-77D	10-Aug-94	B0C7P3	Chloroprene	0.61	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Chrysene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Cresols (methylphenols)	4.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Delta-BHC	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Di-n-butylphthalate	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Di-n-octylphthalate	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Diallate	7.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dibenz[a,h]anthracene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dibenzofuran	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dibromochloromethane	0.16	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dibromomethane	0.15	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dichlorodifluoromethane	0.45	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dieldrin	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Diethyl phthalate	5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dimethoate	10	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Dimethyl phthalate	3.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Diphenylamine	1.7	YU		ppb
699-48-77D	10-Aug-94	B0C7P3	Disulfoton	0.076	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Endosulfan I	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Endosulfan II	0.001	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Endosulfan sulfate	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Endrin	0.004	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Endrin Aldehyde	0.004	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Ethyl cyanide	3.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Ethyl methacrylate	0.18	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Ethyl methanesulfonate	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Ethylbenzene	0.32	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Famphur	3.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Fluoranthene	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Fluorene	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Heptachlor	0.002	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Heptachlor epoxide	0.001	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Hexachlorobenzene	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Hexachlorobutadiene	1.2	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	Hexachlorocyclopentadiene	2.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Hexachloroethane	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Hexachlorophene	6.1	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Hexachloropropene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Indeno(1,2,3-cd)pyrene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Isobutyl alcohol	58	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Isodrin	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Isophorone	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Isosafrole	4.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Kepone	4.1	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Kerosene	7.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methacrylonitrile	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methapyrilene	2.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methoxychlor	0.022	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl Iodide	0.14	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl bromide	0.31	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl chloride	0.43	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl ethyl ketone	14	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl methacrylate	0.41	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl methanesulfonate	1.1	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methyl parathion	0.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Methylene chloride	0.62	BL		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitroso-di-n-dipropylamine	2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosodi-n-butylamine	5.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosodiethylamine	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosodimethylamine	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosodiphenylamine	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosomethylethylamine	1.1	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosomorpholine	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	N-Nitrosopiperidine	3.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Naphthalene	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Nitrobenzene	1.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Nitrosopyrrolidine	1.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	O,O,O-Triethyl phosphorothioat	1.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	O,O-diethylO-2-pyrazinylphosp	2.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	PCDDs	0.091	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	PCDFs	0.11	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Parathion	2.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pentachlorobenzene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pentachloroethane	0.51	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pentachloronitrobenzene (PCNB)	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pentachlorophenol	1.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Phenacetin	1.8	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Phenanthrene	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Phenol	0.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Phenol	0.57	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Phorate	0.033	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pronamide	4.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pyrene	1.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Pyridine	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Safrol	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Styrene	0.55	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Tetrachloroethene	0.38	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Tetrachlorophenols	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Tetraethyldithiopyrophosphate	2.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Tetrahydrofuran	4.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Toluene	0.23	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Total organic carbon	320	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Total organic halogen	7.2			ppb
699-48-77D	10-Aug-94	B0C7P3	Toxaphene	0.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Tributyl Phosphate	3.9	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Trichloroethene	0.27	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Trichloromonofluoromethane	0.21	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Trichlorophenols	2.1	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Tris-2-chloroethyl phosphate	2.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Vinyl acetate	2.7	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Vinyl chloride	0.39	U		ppb
699-48-77D	10-Aug-94	B0C7P3	Xylenes (total)	0.45	U		ppb
699-48-77D	10-Aug-94	B0C7P3	allylchloride	0.42	U		ppb
699-48-77D	10-Aug-94	B0C7P3	alpha,alpha-Dimethylphenethyla	7.5	U		ppb
699-48-77D	10-Aug-94	B0C7P3	cis-1,3-Dichloropropene	0.17	U		ppb
699-48-77D	10-Aug-94	B0C7P3	gamma-BHC (Lindane)	0.002	U		ppb

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77D	10-Aug-94	B0C7P3	m-Cresol	6.3	XU		ppb
699-48-77D	10-Aug-94	B0C7P3	m-dinitrobenzene	1.3	U		ppb
699-48-77D	10-Aug-94	B0C7P3	o-Toluidine	5.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	p-Dimethylaminoazobenzene	1.4	U		ppb
699-48-77D	10-Aug-94	B0C7P3	p-Phenylenediamine	2.6	U		ppb
699-48-77D	10-Aug-94	B0C7P3	sym-Trinitrobenzene	3.2	U		ppb
699-48-77D	10-Aug-94	B0C7P3	trans-1,3-Dichloropropene	0.16	U		ppb
699-48-77D	10-Aug-94	B0C7P3	trans-1,4-dichloro-2-butene	2.2	U		ppb
699-48-77D	10-Aug-94	B0C7P4	Total organic carbon	320	U		ppb
699-48-77D	10-Aug-94	B0C7P4	Total organic halogen	8.4			ppb
699-48-77D	10-Aug-94	B0C7P5	Total organic carbon	320	U		ppb
699-48-77D	10-Aug-94	B0C7P5	Total organic halogen	11.6			ppb
699-48-77D	10-Aug-94	B0C7P6	Total organic carbon	320	U		ppb
699-48-77D	10-Aug-94	B0C7P6	Total organic halogen	7.4			ppb

APPENDIX C.4

RADIONUCLIDES

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Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77A	19-Jun-92	B06W97	Tritium	64.3		240.4	pCi/L
699-48-77A	19-Jun-92	B06W97	Gross alpha	1.73		1.254	pCi/L
699-48-77A	19-Jun-92	B06W97	Gross beta	5.05		2.674	pCi/L
699-48-77A	19-Jun-92	B06W97	Iodine-129	0.192		0.3096	pCi/L
699-48-77A	02-Sep-92	B078V0	Tritium	139		229	pCi/L
699-48-77A	02-Sep-92	B078V0	Gross alpha	1.76		1.279	pCi/L
699-48-77A	02-Sep-92	B078V0	Gross beta	2.7		2.291	pCi/L
699-48-77A	02-Nov-92	B07LG2	Iodine-129	0.041	U	0.329	pCi/L
699-48-77A	22-Feb-93	B08702	Tritium	94.1	U	226.8	pCi/L
699-48-77A	22-Feb-93	B08702	Gross alpha	2.31		1.401	pCi/L
699-48-77A	22-Feb-93	B08702	Gross beta	5.55		2.615	pCi/L
699-48-77A	17-May-93	B08JD2	Tritium	88.6	U	236.9	pCi/L
699-48-77A	17-May-93	B08JD2	Gross alpha	2.77		1.601	pCi/L
699-48-77A	17-May-93	B08JD2	Gross beta	6.74		2.751	pCi/L
699-48-77A	17-May-93	B08JD2	Iodine-129	0.369		0.343	pCi/L
699-48-77A	02-Sep-93	B090T6	Tritium	64	U	201.6	pCi/L
699-48-77A	02-Sep-93	B090T6	Gross alpha	1.67		1.226	pCi/L
699-48-77A	02-Sep-93	B090T6	Gross beta	2.07		1.628	pCi/L
699-48-77A	02-Sep-93	B090T6	Iodine-129	0.346	U	0.382	pCi/L
699-48-77A	15-Oct-93	B09B39	Tritium	8.35	U	208.6	pCi/L
699-48-77A	15-Oct-93	B09B39	Cesium-137	-3.22	U	6.454	pCi/L
699-48-77A	15-Oct-93	B09B39	Cobalt-60	-3.09	U	7.796	pCi/L
699-48-77A	15-Oct-93	B09B39	Gross alpha	2.54		1.595	pCi/L
699-48-77A	15-Oct-93	B09B39	Gross beta	7.7		2.788	pCi/L
699-48-77A	15-Oct-93	B09B39	Ruthenium-106	8.03	U	48.12	pCi/L
699-48-77A	15-Oct-93	B09B39	Antimony-125	-24.3	U	18.98	pCi/L
699-48-77A	17-Jan-94	B09Q40	Tritium	131	U	223.8	pCi/L
699-48-77A	17-Jan-94	B09Q40	Gross alpha	3.24		1.702	pCi/L
699-48-77A	17-Jan-94	B09Q40	Gross beta	7.34		2.851	pCi/L
699-48-77A	15-Apr-94	B0BRD9	Tritium	212	U	221.9	pCi/L
699-48-77A	15-Apr-94	B0BRD9	Gross alpha	1.45		1.136	pCi/L
699-48-77A	15-Apr-94	B0BRD9	Gross beta	5.38		2.462	pCi/L
699-48-77A	10-Aug-94	B0C754	Tritium	29.7	U	185	pCi/L
699-48-77A	27-Jul-95	B0FZ89	Tritium	142		224	pCi/L
699-48-77C	23-May-94	B0BTY4	Tritium	700		320.5	pCi/L
699-48-77C	23-May-94	B0BTY4	Gross alpha	2.08		1.406	pCi/L

Well	Sample Date	Sample Number	Constituent Name	Result	Qualifier	Error	Units
699-48-77C	23-May-94	B0BTY4	Gross beta	3.94		2.366	pCi/L
699-48-77C	23-May-94	B0BTY4	Radium	0.757		0.388	pCi/L
699-48-77C	10-Aug-94	B0C7N8	Tritium	379		203.8	pCi/L
699-48-77C	10-Aug-94	B0C7N8	Gross alpha	1.26		1.107	pCi/L
699-48-77C	10-Aug-94	B0C7N8	Gross beta	7.19		2.755	pCi/L
699-48-77C	10-Aug-94	B0C7N8	Radium	0.093	U	0.107	pCi/L
699-48-77D	23-May-94	B0BTY9	Tritium	265	U	297.2	pCi/L
699-48-77D	23-May-94	B0BTY9	Gross alpha	0.215	U	0.618	pCi/L
699-48-77D	23-May-94	B0BTY9	Gross beta	6		2.586	pCi/L
699-48-77D	23-May-94	B0BTY9	Radium	0.607		0.355	pCi/L
699-48-77D	10-Aug-94	B0C7P3	Tritium	282		198.3	pCi/L
699-48-77D	10-Aug-94	B0C7P3	Gross alpha	2.09		1.393	pCi/L
699-48-77D	10-Aug-94	B0C7P3	Gross beta	5.73		2.658	pCi/L
699-48-77D	10-Aug-94	B0C7P3	Radium	0.101	U	0.122	pCi/L

APPENDIX D

BACKGROUND GROUND WATER CHEMISTRY CHARACTERISTICS

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APPENDIX D.1

BACKGROUND VALUE STATUS SUMMARY TABLES

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Table D.1-1. Status Summary of Background Values Based on Currently Available Data for Upgradient Well 699-48-77A.

Analyte	Quarters of Data[a]	Tolerance Limits	Comment
Ammonium	6	ND	DL range = 30 - 70 ppb
Acetone	5	ND	DL range = 40 - 100 ppb
Acetophenone	4	ND	DL range = 10 - 20 ppb
Arsenic, unfiltered	9	ND	DL range = 1 - 5 ppb
Benzene	9	ND	DL range[b] = 0.11 - 5 ppb
Beryllium, unfiltered	12	ND	DL range = 0.1 - 3 ppb
Cadmium, unfiltered	12	ND	DL range = 1.5 - 10 ppb
Carbon tetrachloride	9	ND	DL range[b] = 0.12 - 5 ppb
Chloroform	9	ND	DL range[b] = 0.04 - 5 ppb
Chromium, unfiltered	12	480 ppb	see Table D.2-1
Copper, unfiltered	12	ND	DL range = 2.6 - 20 ppb
Gross Alpha	12	4 pCi/L	see Table D.2-1
Gross Beta	12	15 pCi/L	see Table D.2-1
Iron, unfiltered	10	1,700 ppb	see Table D.2-1
TOC	11	ND	DL range = 400 - 1,000 ppb
Lead, unfiltered	9	ND	DL range = 0.51 - 5 ppb
Mercury, unfiltered	8	ND	DL range = 0.10 - 0.2 ppb
Methyl chloride	4	ND	DL = 10 ppb
Methylene chloride	8	ND	DL range[b] = 0.06 - 5 ppb
N-Nitrosodimethylamine	4	ND	DL = 10 ppb
Nitrate (as NO_3^-)	9	32,400 ppb	see Table D.2-1
Nitrite (as NO_2^-)	7	ND	DL range = 38.3 - 200 ppb
Nitrogen; TKN-N	NA	NA	not analyzed
Strontium-90	2	ND	DL range = 0.75 - 0.80 pCi/L
Sulfate	10	26,500 ppb	see Table D.2-1
Tetrachloroethene	9	ND	DL range[b] = 0.05 - 5 ppb
Trichloroethane; 1,1,2	9	ND	DL range[b] = 0.04 - 5 ppb
Tritium	13	1,600	see Table D.2-1
pH, field	14	[7.0, 8.5]	see Table D.2-1

Table D.1-1. Status Summary of Background Values Based on Currently Available Data for Upgradient Well 699-48-77A.

Analyte	Quarters of Data[a]	Tolerance Limits	Comment
Conductivity, field	14	320 μmho/cm	see Table D.2-1
Phthalate	6	ND	DL range = 1.10 - 10 ppb
Tetrahydrofuran	4	ND	DL range = 10 - 100 ppb
Total dissolved solids	8	210 ppm	see Table D.2-1
Total suspended solids	4	ND	DL range = 1 - 4 ppm
Iodine-129	8	ND	DL range = -0.17 - 2.31 pCi/L

NA = not available. DL = method detection limit.
ND = essentially not detected.
[a]excluding outlier(s) and/or unusable data due to a QC deficiency.
[b]lower limit was associated with gas chromatography (GC) and/or different laboratory.

Table D.1-2. Status Summary of Background Values Based on Currently Available Data for Upgradient Well 699-48-77C.

Analyte	Quarters of Data[a]	Tolerance Limits	Comment
Ammonium	4	ND	DL range = 30 - 50 ppb
Acetone	5	ND	DL range = 2.6 - 100 ppb
Acetophenone	6	ND	DL range = 1.5 - 20 ppb
Arsenic, unfiltered	4	ND	DL range = 1.4 - 2.7 ppb
Benzene	6	ND	DL range[b] = 0.11 - 5 ppb
Beryllium, unfiltered	4	ND	DL range = 0.1 - 0.6 ppb
Cadmium, unfiltered	4	ND	DL range = 1.5 - 3.1 ppb
Carbon tetrachloride	6	ND	DL range = 3 - 5 ppb
Chloroform	6	ND	DL range[b] = 0.76 - 5 ppb
Chromium, unfiltered	4	ND	DL range = 2.8 - 15.7 ppb
Copper, unfiltered	4	ND	DL range = 5.0 - 13.6 ppb
Gross Alpha	6	9.4 pCi/L	see Table D.2-2
Gross Beta	6	14 pCi/L	see Table D.2-2
Iron, unfiltered	3	ND	DL range = 75.6 - 96.6 ppb
TOC	5	ND	DL range = 320 - 1,000 ppb
Lead, unfiltered	4	ND	DL range = 0.80 - 1.10 ppb
Mercury, unfiltered	4	ND	DL range = 0.10 - 0.20 ppb
Methyl chloride	6	ND	DL range[b] = 0.15 - 10 ppb
Methylene chloride	3	ND	DL range = 3 - 5 ppb
N-Nitrosodimethylamine	6	ND	DL range = 1.2 - 10 ppb
Nitrate (as NO_3^-)	6	29,300 ppb	see Table D.2-2
Nitrite (as NO_2^-)	4	ND	DL range = 70 - 110 ppb
Nitrogen; TKN-N	NA	NA	not analyzed
Strontium-90	2	ND	DL range = 0.73 - 0.77 pCi/L
Sulfate	6	21,400 ppb	see Table D.2-2
Tetrachloroethene	6	ND	DL range[b] = 0.13 - 5 ppb
Trichloroethane; 1,1,2	6	ND	DL range[b] = 0.16 - 5 ppb
Tritium	6	2,100	see Table D.2-2
pH, field	6	[7.1, 8.5]	see Table D.2-2

Table D.1-2. Status Summary of Background Values Based on Currently Available Data for Upgradient Well 699-48-77C.

Analyte	Quarters of Data[a]	Tolerance Limits	Comment
Conductivity, field	6	310 μmho/cm	see Table D.2-2
Phthalate	6	ND	DL range = 1 - 10 ppb
Tetrahydrofuran	4	ND	DL range = 2.8 - 100 ppb
Total dissolved solids	6	240 ppm	see Table D.2-2
Total suspended solids	4	ND	DL range = 1 - 5 ppm
Iodine-129	4	ND	DL range = -0.45 - 3.32 pCi/L

NA = not available. DL = method detection limit.
ND = essentially not detected.
[a]excluding outlier(s) and/or unusable data due to a QC deficiency.
[b]lower limit was associated with GC and/or different laboratory.

Table D.1-3. Status Summary of Background Values Based on Currently Available Data for Upgradient Well 699-48-77D.

Analyte	Quarters of Data[a]	Tolerance Limits	Comment
Ammonium	4	ND	DL range = 30 - 50 ppb
Acetone	6	ND	DL range = 2.6 - 100 ppb
Acetophenone	6	ND	DL range = 1.5 - 20 ppb
Arsenic, unfiltered	4	ND	DL range = 2.1 - 2.7 ppb
Benzene	6	ND	DL range = 0.11 - 5 ppb
Beryllium, unfiltered	4	ND	DL range = 0.1 - 0.6 ppb
Cadmium, unfiltered	4	ND	DL range = 1.5 - 3.1 ppb
Carbon tetrachloride	6	ND	DL range = 1 - 3 ppb
Chloroform	6	ND	DL range[b] = 0.74 - 5 ppb
Chromium, unfiltered	4	ND	DL range = 8.6 - 12.9 ppb
Copper, unfiltered	4	ND	DL range = 5.0 - 10.9 ppb
Gross Alpha	6	26 pCi/L	see Table D.2-3
Gross Beta	6	7.4 pCi/L	see Table D.2-3
Iron, unfiltered	3	ND	DL range = 53.0 - 75.4 ppb
TOC	5	ND	DL range = 320 - 1,000 ppb
Lead, unfiltered	4	ND	DL range = 0.80 - 1.10 ppb
Mercury, unfiltered	4	ND	DL range = 0.10 - 0.20 ppb
Methyl chloride	6	ND	DL range[b] = 0.15 - 10 ppb
Methylene chloride	3	ND	DL range = 3 - 5 ppb
N-Nitrosodimethylamine	6	ND	DL range = 1.2 - 10 ppb
Nitrate (as NO_3^-)	6	29,500 ppb	see Table D.2-3
Nitrite (as NO_2^-)	4	ND	DL range = 70 - 110 ppb
Nitrogen; TKN-N	NA	NA	not analyzed
Strontium-90	2	ND	DL range = 0.72 - 0.78 pCi/L
Sulfate	6	25,100 ppb	see Table D.2-3
Tetrachloroethene	6	ND	DL range[b] = 0.13 - 5 ppb
Trichloroethane; 1,1,2	6	ND	DL range[b] = 0.16 - 5 ppb
Tritium	6	1,600	see Table D.2-3
pH, field	6	[6.7, 9.4]	see Table D.2-3

Table D.1-3. Status Summary of Background Values Based on Currently Available Data for Upgradient Well 699-48-77D.

Analyte	Quarters of Data[a]	Tolerance Limits	Comment
Conductivity, field	6	320 μmho/cm	see Table D.2-3
Phthalate	6	ND	DL range = 1 - 10 ppb
Tetrahydrofuran	4	ND	DL range = 2.8 - 100 ppb
Total dissolved solids	6	240 ppm	see Table D.2-3
Total suspended solids	4	ND	DL range = 1 - 2 ppm
Iodine-129	4	ND	DL range = -0.04 - 2.87 pCi/L

NA = not available. DL = method detection limit.
ND = essentially not detected.
[a]excluding outlier(s) and/or unusable data due to a QC deficiency.
[b]lower limit was associated with GC and/or different laboratory.

APPENDIX D.2

BACKGROUND VALUES FOR ANTICIPATED PERMIT CONSTITUENTS

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Table D.2-1. Background Values for the Anticipated 216 Permit Constituents at Well 699-48-77A for the C018-H Project.

Description	Chromium[a]	Gross Alpha	Gross Beta	Iron[a]	Nitrate
n	12	12	12	10	9
GT	11	8	9	10	9
LT	1	4	3	0	0
Mean	1.5542[b]	0.2922[b]	0.7147[b]	2.6318[b]	4.2879[b]
Std. Dev.	0.4102[b]	0.1117[b]	0.1703[b]	0.2067[b]	0.0735[b]
k	2.736	2.736	2.736	2.911	3.031
CTL	475[c]	3.96[c]	15.16[c]	1,712[c]	32,413[c]
Reported[e] TL	480	4.0	15	1,700	32,400

Description	Sulfate	Total Dissolved Solids	Tritium	Field pH	Field Conductivity
n	10	8	13	14	14
GT	10	8	1	14	14
LT	0	0	12	0	0
Mean	4.3504[b]	2.2618[b]	2.0002[b]	7.738	287.821
Std. Dev.	0.0248[b]	0.0195[b]	0.4531[b]	0.2425	11.0368
k	2.911	3.188	2.670	3.012	2.614
CTL	26,461[c]	211[c]	1,622[c]	[7.0, 8.5]	317[d]
Reported[e] TL	26,500	210	1,600	[7.0, 8.5]	320

n = total number of samples.
GT = number of samples greater than the detection limit.
LT = number of samples less than or equal to the detection limit.
CTL = calculated tolerance limit.
TL = tolerance limit.
[a]excluding outlier(s).
[b]in unit of $\log_{10}$ ppb; in unit of $\log_{10}$ pCi/L for gross alpha, gross beta, and tritium; in unit of $\log_{10}$ ppm for total dissolved solids.
[c]in unit of ppb; in unit of pCi/L for gross alpha, gross beta and tritium; in unit of ppm for total dissolved solids.
[d]in unit of μmho/cm.
[e]reported to two or three significant digits depending on constituent analytical uncertainty.

Table D.2-2. Background Values for the Anticipated 216 Permit Constituents at Well 699-48-77C for the C018-H Project.

Description	Gross Alpha	Gross Beta	Nitrate	Sulfate
n	6	6	6	6
GT	3	6	6	6
LT	3	0	0	0
Mean	0.0086[b]	0.7561[b]	4.3641[b]	4.2786[b]
Std. Dev.	0.2597[b]	0.1058[b]	0.0279[b]	0.0140[b]
k	3.707	3.707	3.707	3.707
CTL	9.37[c]	14.07[c]	29,347[c]	21,396[c]
Reported[e] TL	9.4	14	29,300	21,400
Description	**Tritium**	**Total Dissolved Solids**	**Field pH**	**Field Conductivity**
n	6	6	6	6
GT	5	6	6	6
LT	1	0	0	0
Mean	2.6727[b]	2.2812[b]	7.795	288.125
Std. Dev.	0.1753[b]	0.0248[b]	0.1479	4.9693
k	3.707	3.707	4.414	3.707
CTL	2,102[c]	236[c]	[7.1, 8.4]	307[d]
Reported[e] TL	2,100	240	[7.1, 8.4]	310

n = total number of samples.
GT = number of samples greater than the detection limit.
LT = number of samples less than or equal to the detection limit.
CTL = calculated tolerance limit.
TL = tolerance limit.
[a]excluding outlier(s).
[b]in unit of $\log_{10}$ ppb; in unit of $\log_{10}$ pCi/L for gross alpha, gross beta, and tritium; in unit of $\log_{10}$ ppm for total dissolved solids.
[c]in unit of ppb; in unit of pCi/L for gross alpha, gross beta and tritium; in unit of ppm for total dissolved solids.
[d]in unit of μmho/cm.
[e]reported to two or three significant digits depending on constituent analytical uncertainty.

Table D.2-3. Background Values for the Anticipated 216 Permit Constituents at Well 699-48-77D for the C018-H Project.

Description	Gross Alpha	Gross Beta	Nitrate	Sulfate
n	6	6	6	6
GT	3	6	6	6
LT	3	0	0	0
Mean	-0.1814[b]	0.7622[b]	4.3545[b]	4.3445[b]
Std. Dev.	0.4318[b]	0.0292[b]	0.0311[b]	0.0148[b]
k	3.707	3.707	3.707	3.707
CTL	26.26[c]	7.42[c]	29,490[c]	25,086[c]
Reported[e] TL	26	7.4	29,500	25,100
Description	**Tritium**	**Total Dissolved Solids**	**Field pH**	**Field Conductivity**
n	6	6	6	6
GT	4	6	6	6
LT	2	0	0	0
Mean	2.4177[b]	2.3009[b]	8.077	297.917
Std. Dev.	0.2105[b]	0.0222[b]	0.3062	5.7308
k	3.707	3.707	4.414	3.707
CTL	1,577[c]	242[c]	[6.7, 9.4]	319[d]
Reported[e] TL	1,600	240	[6.7, 9.4]	320

n = total number of samples.
GT = number of samples greater than the detection limit.
LT = number of samples less than or equal to the detection limit.
CTL = calculated tolerance limit.
TL = tolerance limit.
[a]excluding outlier(s).
[b]in unit of $\log_{10}$ ppb; in unit of $\log_{10}$ pCi/L for gross alpha, gross beta, and tritium; in unit of $\log_{10}$ ppm for total dissolved solids.
[c]in unit of ppb; in unit of pCi/L for gross alpha, gross beta and tritium; in unit of ppm for total dissolved solids.
[d]in unit of μmho/cm.
[e]reported to two or three significant digits depending on constituent analytical uncertainty.

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APPENDIX E

WELL LOGS FOR THE TRITIUM-TRACKING NETWORK

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WELL CONSTRUCTION AND COMPLETION SUMMARY

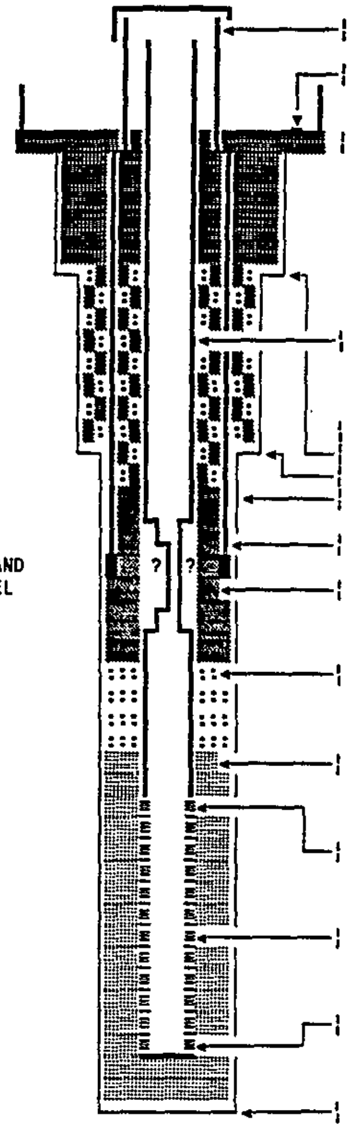
Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W6-5 TEMPORARY WELL NO: W6-MW6
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,509.7 E/W W 73,479.6
Driller's Name: G. White	WA State Lic Nr: Not documented	State NAD 83 Coordinates: N 137,638.63m 451,623 E 567,493.33m 2,221,726
Drilling Company: Jensen Drilling Co	Company Location: Not documented	Start Card #: Not documented T___ R___ S___
Date Started: 12Aug91	Date Complete: 31Oct91	Elevation Ground surface (ft): 710.94 (Brass cap)

Depth to water: 256.3-ft Oct91
(Ground surface)________

GENERALIZED STRATIGRAPHY Geologist's Log
Sl=slightly

0-5: Not documented
5-10: Sandy silt GRAVEL
10-15: Sandy GRAVEL
15-20: Gravelly silty SAND
20-25: Sl gravelly SAND
25-30: SAND
30-35: Gravelly sandy CALICHE
35-60: SAND
60-70: Sl gravelly SAND
70-112: SAND
112-125: Sandy GRAVEL
125-130: Sl silty sandy GRAVEL
130-140: Sandy GRAVEL
140-145: Sl silty sandy GRAVEL
145-155: Gravelly SAND
155-170: Silty sandy GRAVEL
170-175: Gravelly silty SAND
175-190: SAND
190-195: Sl silty sl gravelly SAND
195-230: Sl silty sl sandy GRAVEL
230-286.6: Sandy GRAVEL

NOTE:
Field measurements indicate casing is collapsed at approximately 179-ft.



Elevation of reference point: (top of casing) [714.06-ft]
Height of reference point above ground surface [3.12-ft]
Depth of surface seal [1.5-20.0-ft]
Type of surface seal: Pre-mix concrete 4x4-ft x 6-in surface pad to 1.5-ft
4 equidistant protective posts
Cement grout, 1.5-20.0-ft

I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel

Diameter of borehole,
0-19.0-ft, 13-in nominal
19.0-160.9-ft, 11-in nominal
160.9-286.6-ft, 9-in nominal

8-in carbon steel casing left in hole -1.5-174.7-ft
Type of filler, 20.0-249.5-ft
Bentonite slurry, 20.0-169.0-ft
Bentonite crumbles, 169.0-249.5-ft

Depth top of seal: [249.5-ft]
Type of seal: Bentonite pellets

Depth top of sand pack: [257.2-ft]
10-20-mesh silica sand

Depth top of screen: [264.0-ft]
4-in, #20-slot, stainless steel

Screen is damaged, could not use 4-in pump for development

Depth bottom of screen [284.7-ft]

Depth to bottom of borehole: [286.6-ft]

Drawing By: RKL/2W06-05.ASB Date: 15Apr93

Reference:________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W6-5

WELL DESIGNATION	:	299-W6-5
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG-5
HANFORD COORDINATES	:	N 46,509.7 W 73,479.6 [200W-20May92]
LAMBERT COORDINATES	:	N 451,623 E 2,221,726 [HANCONV] N 137,638.63m E 567,493.33m [NAD83-20May92]
DATE DRILLED	:	Oct91
DEPTH DRILLED (GS)	:	286.6-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	256.3-ft, Oct91;
CASING DIAMETER	:	4-in stainless steel, +1.0~264.0-ft; 6-in stainless steel, +3.12~0.5-ft 8-in carbon steel, -1.5~174.7-ft
ELEV TOP CASING	:	714.06-ft, [NGVD'29-20May92]
ELEV GROUND SURFACE	:	710.94-ft, Brass cap [NGVD'29-20May92]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	264.0~284.7-ft, 4-in #20-slot stainless steel; Screen is damaged, extent not documented
COMMENTS	:	FIELD INSPECTION, OTHER: Casing apparently collapsed @ 179-ft. Damaged during installation. Unable to measure water levels.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	No water level data Not on water sample schedule
PUMP TYPE	:	Hydrostar, intake @ 282.4-ft (TOC)
MAINTENANCE	:	

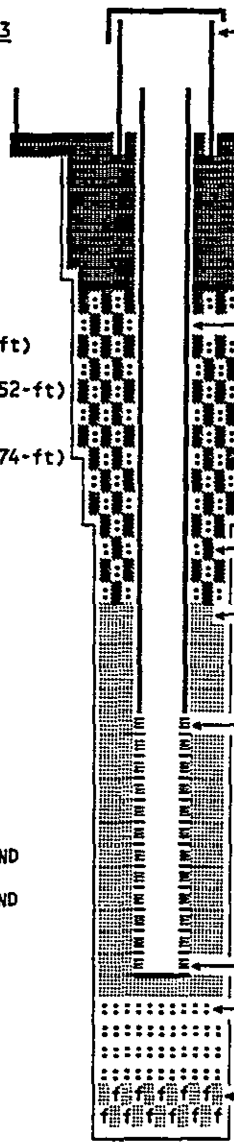
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W6-6 TEMPORARY WELL NO: W6-MW8
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,511.4 E/W W 74,052.5
Driller's Name: Multiple	WA State Lic Nr: Not documented	State NAD83 Coordinates: N 137,638.72m 451,623 E 567,318.74m 2,221,153
Drilling Company: Jensen Drilling Co	Company Location: Not documented	Start Card #: Not documented T___ R___ S___
Date Started: 13Aug91	Date Complete: 24Oct91	Elevation Ground surface (ft): 706.82 (Brass cap)

Depth to water: 257.0-ft Dec91
(Ground surface) 253.0-ft 11Mar93

GENERALIZED STRATIGRAPHY Geologist's Log
Sl=slightly

0-5: Not documented
5-10: Very sandy GRAVEL
10-20: Gravelly SAND
20-25: Very gravelly SAND
25-30: Sandy GRAVEL
30-36.5: Silty SAND
36.5-40: Sandy GRAVEL
40-50: Gravelly SAND
(Possible CALICHE @ 46-47-ft)
50-60: Sl gravelly SAND
(Calcareous sandy SILT, 50-52-ft)
60-70: SAND
70-85: Sl gravelly SAND
(Calcareous sandy SILT, 73-74-ft)
85-90: Sl silty sl gravelly SAND
90-95: Silty SAND
95-100: SAND
100-110: Sl gravelly SAND
110-120: Silty sandy GRAVEL
120-135: Sandy GRAVEL
135-140: Silty sandy GRAVEL
140-150: GRAVEL
150-175: Silty sandy GRAVEL
175-200: Sandy GRAVEL
200-270: Silty sandy GRAVEL
270-285: Sandy GRAVEL
285-320: Silty sandy GRAVEL
320-325: GRAVEL
325-330: Silty sandy GRAVEL
330-340: Gravelly SAND
340-355: Silty sandy GRAVEL
355-375: Sl silty-sl gravelly SAND
375-380: Silty sandy GRAVEL
380-400: Sl silty sl gravelly SAND
400-415: SANDS-GRAVELS
415-435: SAND
435-440: SANDS-GRAVELS
440-472: SANDS



Elevation of reference point: (top of casing) [709.99-ft]
Height of reference point above ground surface [3.17-ft]
Depth of surface seal [2.0-20.7-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad
4 equidistant protective posts
Cement grout 2.0-20.7-ft
I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel
Diameter of borehole,
0-18.1-ft, 17-in nominal
18.1-169.8-ft, 13-in nominal
168.8-340.4-ft, 11-in nominal
340.4-472.0-ft, 9-in nominal
Type of filler, 20.7-406.7-ft
Bentonite slurry
Depth top of sand pack: [406.7-ft]
8-12-mesh, 406.7-408.4-ft
20-40-mesh, 408.4-416.8-ft
10-20-mesh, 416.8-429.5-ft
8-12-mesh, 429.5-435.9-ft
Depth top of screen: [418.6-ft]
4-in, #20-slot, continous wrap
304 stainless steel
Depth bottom of screen: [429.3-ft]
Enviroplug coarse bentonite hole plug, 435.9-462.9-ft
Fill, 462.9-472.0-ft
Depth to bottom of borehole: [472.0-ft]

Drawing By: RKL/2W06-06.ASB Date: 15Apr93

Reference: __________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W6-6

WELL DESIGNATION	:	299-W6-6
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,511.4 W 74,052.5 [200W-20May92]
LAMBERT COORDINATES	:	N 451,623 E 2,221,153 [HANCONV] N 137,638.72m E 567,318.74m [NAD83-20May92]
DATE DRILLED	:	Oct91
DEPTH DRILLED (GS)	:	472.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	257.0-ft, Dec91; 253.0-ft, 11Mar93
CASING DIAMETER	:	4-in stainless steel, +1.0↔418.6-ft; 6-in stainless steel, +3.17↔¯0.5-ft
ELEV TOP CASING	:	709.99-ft, [NGVD'29-20May92]
ELEV GROUND SURFACE	:	706.82-ft, Brass cap [NGVD'29-20May92]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	418.6↔429.3-ft, 4-in #20-slot stainless steel;
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Quarterly water level measurement, 18Mar↔11Mar93 Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: 200 W Water Supply
Driller's Name: D. Kruger/B. Peters
Drilling Company: Kaiser Engineers
Date Started: 14May91

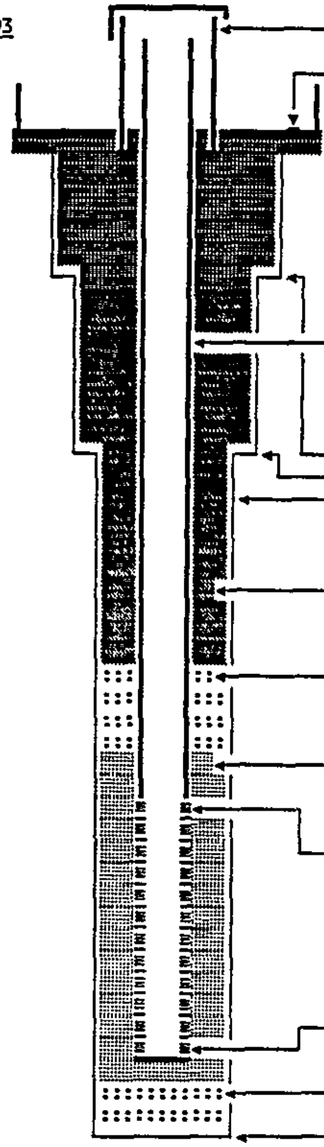
Sample Method: Drive barrel Hard tool
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Hanford
Date Complete: 17Jul91

WELL NUMBER: 299-W6-7
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 46,511.6 E/W W 74,076.9
State NAD 83 137,638.8m 567,311.3m
Coordinates: N 451,623 E 2,221,129
Start Card #: Not documented T___ R___ S___
Elevation Ground surface (ft): 706.85 (Brass cap)

Depth to water: 254.7-ft Jul91
(Ground surface) 252.9-ft 11Mar93

GENERALIZED STRATIGRAPHY
Geologist's Log
Sl=slightly

0-22: Sandy GRAVEL
22-27: Sl silty SAND
27-40: Gravelly SAND, cemented
40-45: SAND
45-65: Gravelly SAND
65-70: SAND
70-75: Sandy GRAVEL
75-106: SAND, w/interfingered calcium cemented zones
106-276.2: Sandy GRAVEL



Elevation of reference point: [710.28-ft]
(top of casing)
Height of reference point above ground surface [3.43-ft]
Depth of surface seal [1.9-21.6-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 3.4-ft
4 equidistant protective posts
Cement grout, 1.9-20.6-ft

I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel

Diameter of borehole,
0-19.7-ft, 13-in nominal
19.7-155.4-ft, 11-in nominal
155.4-276.2-ft, 9-in nominal

Type of filler, 20.6-238.9-ft
8-20-mesh, bentonite crumbles

Depth top of seal: [238.9-ft]
Type of seal:
1/4-1/2-in bentonite pellets

Depth top of sand pack: [242.3-ft]
20-40-mesh silica sand

Depth top of screen: [246.5-ft]
4-in, #10-slot, stainless steel

Depth bottom of screen [267.2-ft]

Bentonite hole plug, 268.1-276.2-ft

Depth to bottom of borehole: [276.2-ft]

Drawing By: RKL/2W06-07.ASB Date: 15Apr93
Reference:

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W6-7

WELL DESIGNATION	:	299-W6-7
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,511.6 W 74,076.9 [200W-20May92]
LAMBERT COORDINATES	:	N 451,623 E 2,221,129 [HANCONV] N 137,638.8m E 567,311.3m [NAD83-20May92]
DATE DRILLED	:	Jul91
DEPTH DRILLED (GS)	:	276.2-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	254.7-ft, Jul91; 252.9-ft, 11Mar93
CASING DIAMETER	:	4-in stainless steel, +0.9↔246.5-ft; 6-in stainless steel, +3.43↔~0.5-ft
ELEV TOP CASING	:	710.28-ft, [NGVD'29-20May92]
ELEV GROUND SURFACE	:	706.85-ft, Brass cap [NGVD'29-20May92]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	246.5↔267.2-ft, 4-in #10-slot stainless steel;
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Quarterly water level measurement, 18Mar↔11Mar93 Not on water sample schedule
PUMP TYPE	:	Hydrostar, intake @ 263.6-ft (GS)
MAINTENANCE	:	

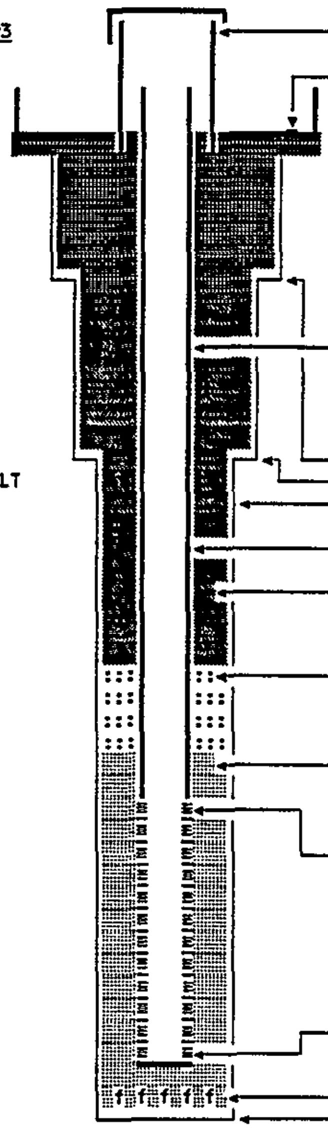
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W6-8
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	TEMPORARY WELL NO:
Driller's Name: M. Wrasper	WA State Lic Nr: Not documented	Hanford Coordinates: N/S N 46,514.0 E/W W 75,003.8
Drilling Company: Kaiser Engineers	Company Location: Hanford	State NAD 83 Coordinates: N 137,638.8m 451,623 E 567,028.8m 2,220,202
Date Started: 30Apr91	Date Complete: 26Aug91	Start Card #: Not documented T___ R___ S___
		Elevation Ground surface (ft): 691.34 (Brass cap)

Depth to water: 233.6-ft Jun91
(Ground surface) 235.9-ft 11Mar93

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0-10: Sandy GRAVEL
10-20: Sandy GRAVEL
20-22.5: Silty sandy GRAVEL
22.5-25: Sl silty SAND
(CALICHE @ 23-23.5-ft)
25-30: Gravelly silty SAND
30-35: Sl gravelly SAND
35-40: Sandy GRAVEL
40-45: Gravelly SAND
45-60: Sl gravelly SAND
60-65: SAND
65-70: Sl gravelly SAND
70-75: Silty gravelly SAND
75-80: Silty SAND
80-85: CALICHE, cemented SAND/SILT
85-90: Sl gravelly SAND
90-95: Gravelly SAND
95-160: Sandy GRAVEL
160-165: Sl sandy GRAVEL
165-190: Sandy GRAVEL
190-199.5: Gravelly SAND
199.5-200.2: SAND
200.2-218: Sandy GRAVEL
218-219.5: SAND
219.5-225: Gravelly SAND
225-240: Sandy GRAVEL
240-245: Sl gravelly SAND
245-249.5: Gravelly SAND
249.5-252: Sandy GRAVEL



Elevation of reference point: (top of casing) [694.73-ft]
Height of reference point above ground surface [3.39-ft]
Depth of surface seal [1.8-21.0-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 1.8-ft
4 equidistant protective posts
Cement grout, 1.8-21.0-ft
I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel
Diameter of borehole,
0-19.9-ft, 13-in nominal
19.9-161.9-ft, 11-in nominal
161.9-251.7-ft, 9-in nominal
Casing partially collapsed during competion
Type of filler, 21.0-222.1-ft
8-20-mesh, bentonite crumbles
Depth top of seal: [222.1-ft]
Type of seal:
1/4-3/8-in bentonite pellets
Depth top of sand pack: [225.9-ft]
20-40-mesh silica sand
Depth top of screen: [229.9-ft]
4-in, #10-slot, stainless steel
Depth bottom of screen [250.6-ft]
Fill, 251-252-ft
Depth to bottom of borehole: [252.0-ft]

Drawing By: RKL/2W06-08.ASB Date: 15Apr93

Reference:

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W6-8

WELL DESIGNATION	:	299-W6-8
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,514.0 W 75,003.8 [200W-20May92]
LAMBERT COORDINATES	:	N 451,623 E 2,220,202 [HANCONV] N 137,638.8m E 567,028.8m [NAD83-20May92]
DATE DRILLED	:	Aug91
DEPTH DRILLED (GS)	:	252.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	233.6-ft, Jul91; 235.9-ft, 11Mar93
CASING DIAMETER	:	4-in stainless steel, +0.9~229.9-ft; 6-in stainless steel, +3.5~-0.5-ft
ELEV TOP CASING	:	694.73-ft, [NGVD'29-20May92]
ELEV GROUND SURFACE	:	691.34-ft, Brass cap [NGVD'29-20May92]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	229.9~250.6-ft, 4-in #10-slot stainless steel;
COMMENTS	:	FIELD INSPECTION, OTHER: Developed by Hydrostar, casing collapsed during completion.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Quarterly water level measurement, 18Mar~11Mar93 Not on water sample schedule
PUMP TYPE	:	Hydrostar, intake @ 249.9-ft (GS)
MAINTENANCE	:	

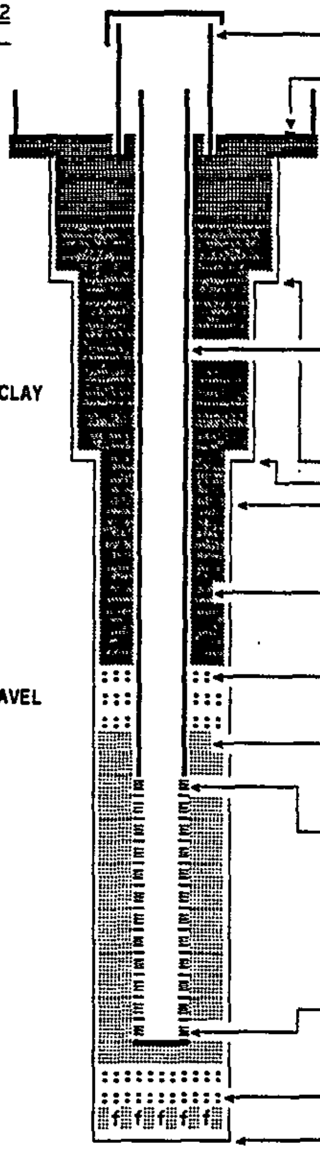
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: ODEX air rotary	Sample Method: Backhoe to 20-ft Air returns	WELL NUMBER: 299-W6-11 TEMPORARY WELL NO: W6-MW #10A
Drilling Fluid Used: None	Additives Used: Not documented	Hanford Coordinates: N/S N 46,500.4 E/W W 74,564.0
Driller's Name: J. Jensen/D. Mingo	WA State Lic Nr: Not documented	State NAD 83 Coordinates: N 137,634.97m 451,611 E 567,162.86m 2,220,642
Drilling Company: Jensen Drilling	Company Location: Not documented	Start Card #: Not documented T___ R___ S___
Date Started: 14Jan92	Date Complete: 21May92	Elevation Ground surface (ft): 700.04 (Brass cap)

Depth to water: 243.9-ft 21May92
(Ground surface)

GENERALIZED STRATIGRAPHY
Geologist's Log
Sl=slightly

0↔5: Not documented
5↔15: Silty sandy GRAVEL
15↔25: Sandy GRAVEL
25↔37: SAND
37↔44: Sandy pebbly GRAVEL
44↔59: Sl silty SAND
59↔67: Sandy SILT
67↔74: No sample recovered
74↔81: SAND
81↔90: Sl gravelly SAND
81↔87: CALICHE zone w/SAND/SILT/CLAY
87↔96: SAND
96↔100: GRAVEL
100↔140: Cobble to pebble GRAVEL
140↔185: Pebble to cobble GRAVEL
185↔196: Pebble GRAVEL
196↔201: SAND
201↔214: Pebble GRAVEL
214↔215.5: SAND
215.5↔221: Pebble to pebble cobble GRAVEL
221↔224: Pebble cobble GRAVEL
224↔241.5: Cobble to pebble cobble GRAVEL
241.5↔242.6: Pebble to cobble GRAVEL
242.6↔245: Pebble to pebble cobble GRAVEL
245↔247: SAND
247↔260: Pebble cobble GRAVEL
260↔280: Pebble to pebble cobble GRAVEL



Elevation of reference point: [702.86-ft]
(top of casing)
Height of reference point above ground surface [2.82-ft]
Depth of surface seal [4.3↔9.6-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 4.3-ft
4 equidistant protective posts
Cement grout, 4.3↔9.6-ft

I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel

Diameter of borehole,
0↔20.0-ft, 13-in nominal
20.0↔97.5-ft, 11-in nominal
97.5↔280.0-ft, 9-in nominal

Type of filler, 9.6↔237.4-ft
Bentonite crumbles

Depth top of seal: [242.1-ft]
Type of seal:
Bentonite hole plug
Depth top of sand pack: [246.4-ft]
20↔40-mesh silica sand

Depth top of screen: [250.9-ft]
4-in, #10-slot, continous wrap
T-304 stainless steel

Depth bottom of screen [271.2-ft]

Bentonite hole plug, 273.9↔278.2-ft

Depth to bottom of borehole: [280.3-ft]

Drawing By: RKL/2W06-11.ASB Date: 06Jul93

Reference: WHC-SD-EN-DP-049

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W6-11

WELL DESIGNATION	:	299-W6-11
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG/WMA-5
HANFORD COORDINATES	:	N 46,500.4 W 74,564.0 [200W-07Aug92]
LAMBERT COORDINATES	:	N 451,611 E 2,220,642 [HANCONV] N 137,634.97m E 567,162.86m [NAD83-07Aug92]
DATE DRILLED	:	May92
DEPTH DRILLED (GS)	:	280.3-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	243.9-ft, 21May92;
CASING DIAMETER	:	4-in stainless steel, +0.9~250.9-ft; 6-in stainless steel, +2.8~~0.5-ft
ELEV TOP CASING	:	702.86-ft, [NGVD'29-07Aug92]
ELEV GROUND SURFACE	:	700.04-ft, Brass cap [NGVD'29-07Aug92]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	250.9~271.2-ft, 4-in #10-slot stainless steel;
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	
PUMP TYPE	:	Hydrostar, intake @ 269.2-ft (GS)
MAINTENANCE	:	

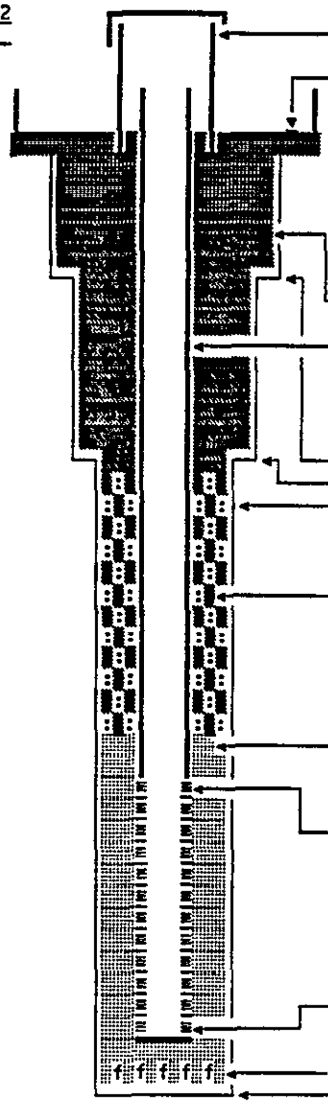
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: ODEX air rotary	Sample Method: Backhoe to 20-ft Air returns	WELL NUMBER: 299-W6-12
Drilling Fluid Used: None	Additives Used: Not documented	TEMPORARY WELL NO: W6-MW #13A
Driller's Name: S. MacKinnon J. Jensen/D. Mingo	WA State Lic Nr: Not documented	Hanford Coordinates: N/S N 46,503.5 E/W W 75,374.3
Drilling Company: Jensen Drilling	Company Location: Not documented	State NAD 83 Coordinates: N 137,635.30m 451,612 E 566,915.91m 2,219,832
Date Started: 15Jan92	Date Complete: 13May92	Start Card #: Not documented T___ R___ S___
		Elevation Ground surface (ft): 689.64 (Brass cap)

Depth to water: 230.7-ft 07May92
(Ground surface)

GENERALIZED STRATIGRAPHY
Geologist's Log
Sl=slightly

0-5: Not documented
5-15: Silty sandy GRAVEL
15-20: Sandy GRAVEL
20-22: Sl silty SAND
22-45: Sandy GRAVEL
45-60: SAND
60-72: Silty SAND
72-81: Sandy SILT
81-85: SAND
85-117: Sandy GRAVEL
117-123: SAND
123-125: GRAVEL
125-126: SILTY interbed
126-187: GRAVEL
187-196: SAND
196-200: Sandy GRAVEL
200-205: Gravelly SAND
205-231: Sandy GRAVEL
231-237: Sl sandy SILT
237-259.3: GRAVEL



Elevation of reference point: [692.51-ft]
(top of casing)

Height of reference point above ground surface [2.87-ft]

Depth of surface seal [3.0-10.0-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 3.0-ft
4 equidistant protective posts
Cement grout, 3.0-10.0-ft

8-20 mesh bentonite crumbles, 10.0-93.4-ft

I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel

Diameter of borehole,
0-20.0-ft, 13-in nominal
20.0-92.9-ft, 11-in nominal
92.9-257.3-ft, 9-in nominal

Bentonite slurry seal, 93.4-237.9-ft

Depth top of sand pack: [237.9-ft]
20-40-mesh silica sand

Depth top of screen: [241.3-ft]
4-in, #10-slot, continous wrap
T-304 stainless steel with
0.3-ft end cap

Depth bottom of screen [257.3-ft]

Fill, 258.6-259.3-ft

Depth to bottom of borehole: [259.3-ft]

Drawing By: RKL/2W06-12.ASB Date: 06Jul93

Reference: WHC-SD-EN-DP-049

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W6-12

WELL DESIGNATION :	299-W6-12
CERCLA UNIT :	200 Aggregate Area Management Study
RCRA FACILITY :	LLBG/WMA-5
HANFORD COORDINATES :	N 46,503.4 W 75,374.3 [200W-07Aug92]
LAMBERT COORDINATES :	N 451,612 E 2,219,832 [HANCONV] N 137,635.30m E 566,915.91m [NAD83-07Aug92]
DATE DRILLED :	May92
DEPTH DRILLED (GS) :	259.3-ft
MEASURED DEPTH (GS) :	Not documented
DEPTH TO WATER (GS) :	230.7-ft, 21May92;
CASING DIAMETER :	4-in stainless steel, +0.9↔241.3-ft; 6-in stainless steel, +2.9↔¯0.5-ft
ELEV TOP CASING :	692.51-ft, [NGVD'29-07Aug92]
ELEV GROUND SURFACE :	689.64-ft, Brass cap [NGVD'29-07Aug92]
PERFORATED INTERVAL :	Not applicable
SCREENED INTERVAL :	241.3↔257.3-ft, 4-in #10-slot stainless steel;
COMMENTS :	FIELD INSPECTION, OTHER:
AVAILABLE LOGS :	Geologist
TV SCAN COMMENTS :	Not applicable
DATE EVALUATED :	Not applicable
EVAL RECOMMENDATION :	Not applicable
LISTED USE :	
PUMP TYPE :	Hydrostar, intake @ 256.6-ft (GS)
MAINTENANCE :	

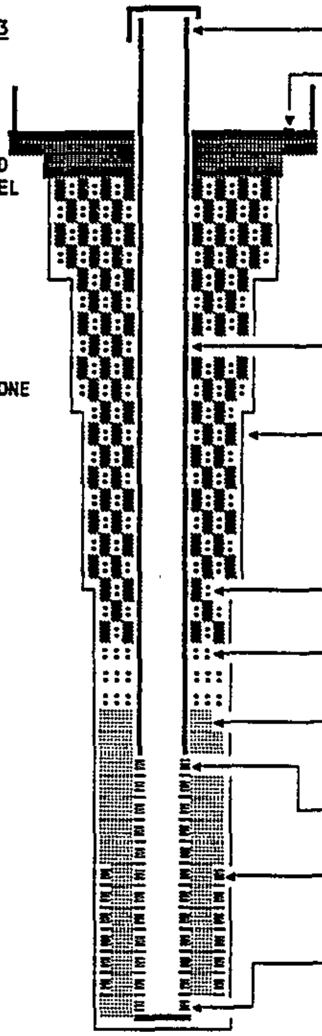
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W7-1
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	TEMPORARY WELL NO: None
Driller's Name: W. Moomaw	WA State Lic Nr: Not documented	Hanford Coordinates: N/S N 46,551 E/W W 78,601
Drilling Company: Onwego Drilling Co	Company Location: Kennewick, WA	State Coordinates: N 451,622 E 2,217,821
Date Started: 01Jun87	Date Complete: 30Jul87	Start Card #: Not documented T____ R____ S______
		Elevation Ground surface (ft): 688.55 (Brass cap)

Depth to water: 226.0-ft Jul87
(Ground surface) 229.9-ft 24Mar93

GENERALIZED STRATIGRAPHY Geologist's Log

5↔6: Slightly silty gravelly SAND
10↔11: Slighlty silty sandy GRAVEL
14↔30: Silty sandy GRAVEL
30↔64: Sandy GRAVEL
64↔73: Silty SAND
73↔79: Sandy silty CALICHE
79↔82: CALICHE and SAND
82↔99: Silty SAND
99↔130: Coarse SAND
130↔135: Slightly gravelly SAND
135↔139: SAND w/calcareous MUDSTONE and CLAY layers
139↔142: SAND
142↔190: Silty sandy GRAVEL
190↔194: Gravelly SAND
194↔244: Silty sandy GRAVEL
244↔245: Gravelly silty SAND



Elevation of reference point: (top of casing) [690.71-ft]

Height of reference point above ground surface [2.16-ft]

Depth of surface seal [0↔20-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 3.0-ft
4 equidistant protective posts
Volclay grout 3↔212-ft

I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel

Diameter of borehole,
0↔10-ft, 17-in nominal
10↔63.4-ft, 13-in nominal
63.4↔157.1-ft, 11-in nominal
157.1↔245-ft, 9-in nominal

Type of filler, 3↔217-ft
Volclay grout

Depth top of seal: [212.0-ft]
Type of seal: Volclay pellets

Depth top of sand pack: [217-ft]
20↔30-mesh silica sand

Depth top of screen: [224.0-ft]
4-in, #20-slot, continous wrap
304 stainless steel

Telescoping screen, 233↔243-ft
8-in, #30-slot, continous wrap
304 stainless steel

Depth bottom of screen: [245.0-ft]
Depth bottom of borehole:

Drawing By: RKL/2W07-01.ASB Date: 15Apr93

Reference: ____________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-1

WELL DESIGNATION	:	299-W7-1
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLWMA-3
HANFORD COORDINATES	:	N 46,551 W 78,601 [200W-10Dec87
LAMBERT COORDINATES	:	N 451,622 E 2,217,821 [10Dec87]
DATE DRILLED	:	Jul87
DEPTH DRILLED (GS)	:	244.8-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	226.0-ft, Jul87; 229.9-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +2.16–224-ft
ELEV TOP CASING	:	690.71-ft, [200W-10Dec87]
ELEV GROUND SURFACE	:	688.55-ft, Brass cap [200W-10Dec87]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	224–245-ft, 4-in #20-slot stainless steel; 233–243-ft, 8-in telescoping, #30-slot, stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurements, 01Dec87–24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

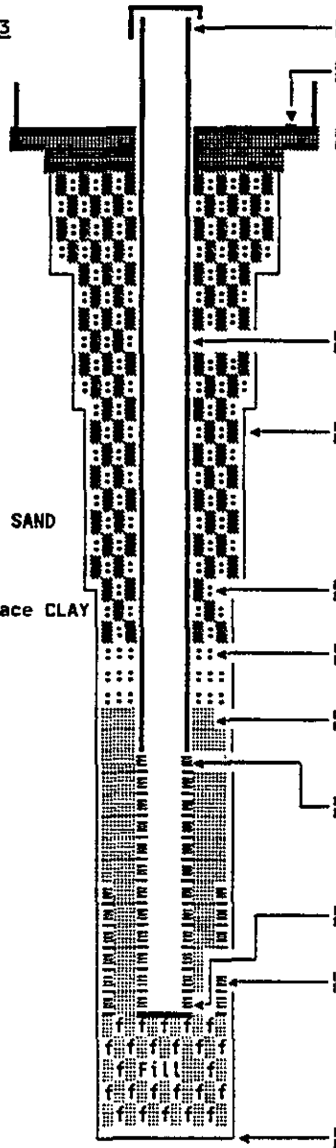
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool	WELL NUMBER: 299-W7-2 TEMPORARY WELL NO: None
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,519 E/W W 77,385
Driller's Name: H. Joy	WA State Lic Nr: Not documented	State Coordinates: N 451,622 E 2,217,821
Drilling Company: Onwego Drilling Co	Company Location: Kennewick, WA	Start Card #: Not documented T____ R____ S______
Date Started: 04Aug87	Date Complete: 30Sep87	Elevation Ground surface (ft): 673.19 (Brass cap)

Depth to water: 217.8-ft Sep87
(Ground surface) 215.8-ft 24Mar93

GENERALIZED Geologist's STRATIGRAPHY Log

0-10: (Backhoe)
10-20: Silty sandy GRAVEL
20-25: Sandy GRAVEL
25-30: Silty sady GRAVEL
30-35: Gravelly SAND
35-40: Sitly sandy GRAVEL
40-45: SILT
45-50: Gravelly sandy SILT
50-70: Silty sandy GRAVEL
70-80: Silty gravelly SAND
80-94: Silty SAND
94-100: Silty sandy GRAVEL
100-105: Gravelly silty SAND
105-147: Silty sandy GRAVEL
147-149: SILT
149-154: Gravelly SAND
154-160: Slightly silty gravelly SAND
160-185: Silty sandy GRAVEL
185-190: Silty gravelly SAND
190-195: Gravelly SAND
195-205: Silty gravelly SAND, trace CLAY
205-210: Sandy GRAVEL
210-215: Silty gravelly SAND
215-220: Slightly gravelly SAND
220-225: Sandy GRAVEL
225-230: Gravelly SAND
230-235: GRAVEL
235-236: Silty gravelly SAND



Elevation of reference point: (top of casing) [675.59-ft]

Height of reference point above ground surface [2.4-ft]

Depth of surface seal [0-194-ft]

Type of surface seal: Pre-mix concrete 4x4-ft x 6-in surface pad to 4.0-ft 4 equidistant protective posts Envirogel bentonite grout 4-194.3-ft

I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel

Diameter of borehole,
0-10-ft, 17-in nominal
10-63.1-ft, 13-in nominal
63.1-154.0-ft, 11-in nominal
154.0-236-ft, 9-in nominal

Type of filler, 4-194.3-ft
Envirogel bentontite grout

Depth top of seal: [194.3-ft]
Type of seal: Volclay pellets

Depth top of sand pack: [198.3-ft]
10-20-mesh silica sand

Depth top of screen: [202.0-ft]
4-in, #20-slot, continous wrap 304 stainless steel

Depth bottom of screen: [222.0-ft]

Telescoping screen, ~212-222-ft
8-in, #30-slot, continous wrap 304 stainless steel

Depth to bottom of borehole: [236.0-ft]

Drawing By: RKL/2W07-02.ASB   Date: 16Apr93

Reference: ____________________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-2

WELL DESIGNATION	:	299-W7-2
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLWMA-3
HANFORD COORDINATES	:	N 46,519 W 77,385 [200W-10Dec87]
LAMBERT COORDINATES	:	N 451,622 E 2,217,821 [HANCONV]
DATE DRILLED	:	Sep87
DEPTH DRILLED (GS)	:	236.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	217.8-ft, Sep87; 215.8-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +2.40↔202-ft
ELEV TOP CASING	:	675.59-ft, [200W-10Dec87]
ELEV GROUND SURFACE	:	673.19-ft, Brass cap [200W-10Dec87]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	202↔222-ft, 4-in #20-slot stainless steel; 212↔222-ft, 8-in telescoping, #30-slot, stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG monthly water level measurement, 01Dec87↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

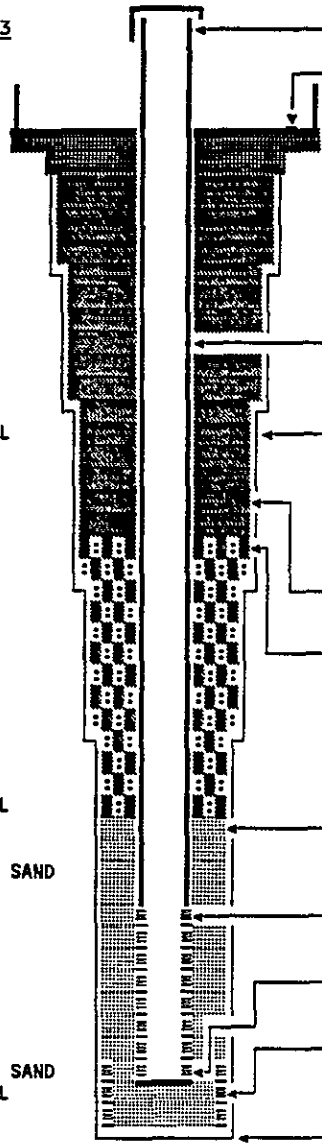
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool	WELL NUMBER: 299-W7-3 TEMPORARY WELL NO: None
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,520 E/W W 77,420
Driller's Name: W. Moomaw	WA State Lic Nr: Not documented	State Coordinates: N 451,623 E 2,217,786
Drilling Company: Onwego Drilling Co	Company Location: Kennewick, WA	Start Card #: Not documented T___ R___ S___
Date Started: 27Jul87	Date Complete: 23Nov87	Elevation Ground surface (ft): 673.71 (Brass cap)

Depth to water: 211.7-ft Sep87
(Ground surface) 217.4-ft 24Mar93

GENERALIZED STRATIGRAPHY Geologist's Log

0-5: GRAVEL (Backhoe to 8-ft)
10-35: Silty sandy GRAVEL
35-40: Gravelly silty CLAY
40-45: Silty sandy GRAVEL
45-50: Gravelly sandy SILT
50-65: Silty sandy GRAVEL
65-85: Gravelly silty SAND
85-95: Gravelly SAND
95-100: SAND
100-110: Gravelly SAND
110-120: Silty sandy GRAVEL
120-125: Silty gravelly SAND
125-145: Silty sandy-sandy GRAVEL
145-140: Silty gravelly SAND
140-175: Silty sandy GRAVEL
175-180: Silty gravelly SAND
180-185: Sandy GRAVEL
185-195: Gravelly SAND
195-205: Sandy GRAVEL
205-220: Silty gravelly SAND
220-235: Sandy GRAVEL
235-255: Slightly silty-slightly gravelly SAND
255-262: SAND W/CLAY 259-261-ft
262-280: Sandy GRAVEL
280-285: Gravelly SAND
285-310: Sandy GRAVEL-GRAVEL
315-320: Gravelly SAND
320-325: GRAVEL
325-345: Silty sandy-sandy GRAVEL
345-350: Gravelly SAND
350-355: Silty sandy GRAVEL
355-370: Gravelly silty-gravelly SAND
370-380: SAND
380-390: Silty sandy GRAVEL
390-400: Gravelly SAND
400-405: Sandy GRAVEL
405-410: Gravelly silty SAND
410-415: Silty sandy GRAVEL
415-420: Gravelly silty SAND
420-435: Sandy GRAVEL
435-445: Gravelly-gravelly silty SAND
445-465: Silty sandy-sandy GRAVEL
465-473: SAND-sandy GRAVEL
473-476.7: BASALT



Elevation of reference point: (top of casing) [676.14-ft]
Height of reference point above ground surface [2.43-ft]
Depth of surface seal [0-20-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 5.0-ft
4 equidistant protective posts
Dry bentonite 5-20-ft

I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel

Diameter of borehole,
0-48-ft, 21-in nominal
48-147-ft, 17-in nominal
147-230-ft, 13-in nominal
230-350-ft, 11-in nominal
350-476.7-ft, 9-in nominal

Type of filler, 20-196-ft
Bentonite slurry

Depth top of seal: [196.0-ft]
Type of seal: Volclay grout

Depth top of sand pack: [427.0-ft]
20-30-mesh silica sand

Depth top of screen: [449.0-ft]
4-in, #20-slot, continous wrap
304 stainless steel
Depth bottom of screen: [470.0-ft]

Telescoping screen, ~470-476.7-ft
8-in, #30-slot, continous wrap
304 stainless steel (damaged)

Depth to bottom of borehole: [476.7-ft]

Drawing By: RKL/2W07-03.ASB Date: 16Apr93

Reference:____________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-3

WELL DESIGNATION	:	299-W7-3
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLWMA-3
HANFORD COORDINATES	:	N 46,520 W 77,420 [200W-10Dec87]
LAMBERT COORDINATES	:	N 451,623 E 2,217,786 [HANCONV]
DATE DRILLED	:	Nov87
DEPTH DRILLED (GS)	:	476.7-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	211.7-ft, Sep87; 217.4-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +2.43↔449-ft
ELEV TOP CASING	:	676.14-ft, [200W-10Dec87]
ELEV GROUND SURFACE	:	673.71-ft, Brass cap [200W-10Dec87]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	449↔470-ft, 4-in #20-slot stainless steel; ~470↔477-ft, 8-in telescoping, #30-slot, stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 01Dec87↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

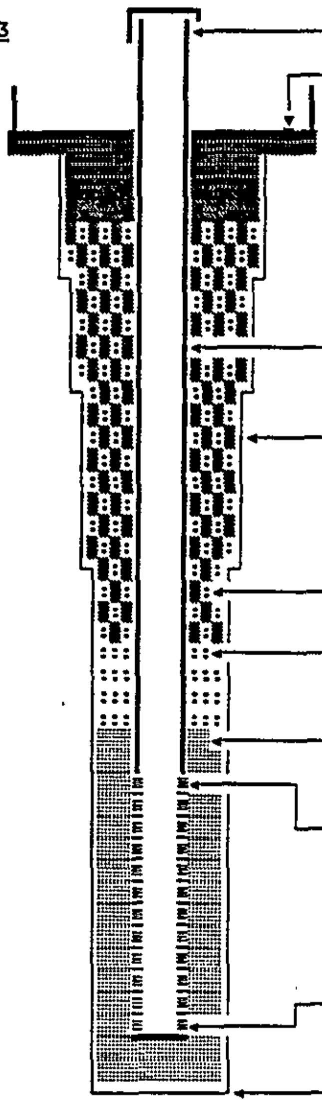
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool	WELL NUMBER: 299-W7-5
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	TEMPORARY WELL NO: None
Driller's Name: H. Joy/D. Garcia	WA State Lic Nr: Not documented	Hanford Coordinates: N/S N 46,509 E/W W 76,816
Drilling Company: Onwego Drilling Co	Company Location: Kennewick, WA	State Coordinates: N 445,614 E 2,218,405
Date Started: 30Sep87	Date Complete: 19Nov87	Start Card #: Not documented T___ R___ S___
		Elevation Ground surface (ft): 670.41 (Brass cap)

Depth to water: 211-ft Nov87
(Ground surface) 213.5-ft 24Mar93

GENERALIZED STRATIGRAPHY — Geologist's Log

5,10: GRAVEL
10: Sandy GRAVEL
15-25: Sandy GRAVEL
30-45: Silty sandy GRAVEL
50,55: Silty gravelly SAND
60: Gravelly silty SAND
65-75: Silty gravelly SAND
80-105: Sandy GRAVEL
110-125: Silty sandy GRAVEL
130-150: Sandy GRAVEL
155-185: Silty sandy GRAVEL
190-200: silty gravelly SAND
205: Silty sandy GRAVEL
210: Silty gravelly SAND
215: Gravelly SAND
220: Sandy GRAVEL
225: Silty/clayey SAND



Elevation of reference point: (top of casing) [673.05-ft]
Height of reference point above ground surface [2.64-ft]
Depth of surface seal [0-5-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad
4 equidistant protective posts
Dry bentonite 2-5-ft

I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel

Diameter of borehole,
0-10.0-ft, 17-in nominal
10.0-50.8-ft, 13-in nominal
50.8-154.6-ft, 11-in nominal
154.6-229.0-ft, 9-in nominal

Type of filler, 5-190-ft
Bentonite slurry

Depth top of seal: [190.0-ft]
Type of seal: Dry bentonite, 190-197-ft
Volclay pellets, 197-200-ft

Depth top of sand pack: [200-ft]
10-20-mesh silica sand

Depth top of screen: [207.0-ft]
4-in, #20-slot
stainless steel

Depth bottom of screen [227.7-ft]

Depth to bottom of borehole: [229.0-ft]

Drawing By: RKL/2W07-05.ASB Date: 16Apr93

Reference: __________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-5

WELL DESIGNATION	:	299-W7-5
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLWMA-3
HANFORD COORDINATES	:	N 46,509 W 76,816 [200W-18Jul90]
LAMBERT COORDINATES	:	N 445,614 E 2,218,405 [HANCONV]
DATE DRILLED	:	Nov87
DEPTH DRILLED (GS)	:	229.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	211.0-ft, Nov87; 213.5-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +2.64→207-ft
ELEV TOP CASING	:	673.05-ft, [200W-18Jul90]
ELEV GROUND SURFACE	:	670.41-ft, Brass cap [200W-18Jul90]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	207→227.7-ft, 4-in #20-slot stainless steel;
COMMENTS	:	FIELD INSPECTION, 20Jan92; Stainless steel casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID. Not in radiation zone. OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 10Dec87→24Mar93 Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

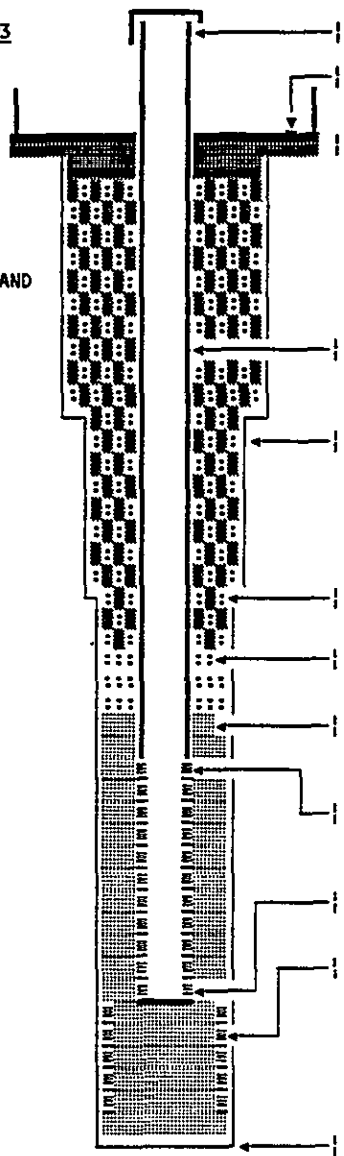
Drilling Method: Cable tool	Sample Method: Hard tool
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented
Driller's Name: B. Boley	WA State Lic Nr: Not documented
Drilling Company: Onwego Drilling Co	Company Location: Kennewick, WA
Date Started: 02Sep87	Date Complete: 02Nov87

WELL NUMBER: 299-W7-6	TEMPORARY WELL NO: None
Hanford Coordinates: N/S N 46,509	E/W W 76,219
State Coordinates: N 451,615	E 2,218,987
Start Card #: Not documented	T___ R___ S___
Elevation Ground surface (ft): 676.25 (Brass cap)	

Depth to water: 218.0-ft Sep87
(Ground surface) 219.4-ft 24Mar93

GENERALIZED STRATIGRAPHY | Geologist's Log

0-5: Not documented
5-10: Sandy GRAVEL
10-15: Gravelly SAND
15-20: Sandy GRAVEL
20-35: Silty sandy GRAVEL
35-45: Slightly silty gravelly SAND
45-55: Gravelly SAND
55-75: Slightly gravelly SAND
75-80: Gravelly SAND
80-100: Gravelly silty SAND
100-105: Silty gravelly SAND
105-110: Gravelly silty SAND
110-175: Sandy GRAVEL
175-190: Silty sandy GRAVEL
190-195: Silty gravelly SAND
195-205: Silty sandy GRAVEL
205-210: Sandy GRAVEL
210-215: Silty sandy GRAVEL
215-230: Sandy GRAVEL
230-235: Silty gravelly SAND
235-242.8: Silty sandy GRAVEL



Elevation of reference point: (top of casing) [678.64-ft]

Height of reference point above ground surface [2.39-ft]

Depth of surface seal [0-200-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 2.0-ft
4 equidistant protective posts
Dry bentonite 2-3-ft
Bentonite slurry 3-200.5-ft

I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel

Diameter of borehole,
0-51.2-ft, 13-in nominal
51.2-152-ft, 11-in nominal
152-242.8-ft, 9-in nominal

Type of filler, 3-200.5-ft
Bentonite slurry

Depth top of seal: [200.5-ft]
Type of seal: Volclay pellets

Depth top of sand pack: [205.5-ft]
10-20-mesh silica sand

Depth top of screen: [209.0-ft]
4-in, #20-slot, continous wrap
304 stainless steel

Depth bottom of screen: [229.0-ft]

Telescoping screen, 231-241-ft
8-in, #30-slot, continous wrap
304 stainless steel

Depth to bottom of borehole: [242.8-ft]

Drawing By: RKL/2W07-06.ASB Date: 16Apr93

Reference: ____________

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-6

WELL DESIGNATION	:	299-W7-6
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLWMA-3
HANFORD COORDINATES	:	N 46,509 W 76,219 [200W-10Dec87]
LAMBERT COORDINATES	:	N 451,615 E 2,218,987 [HANCONV]
DATE DRILLED	:	Nov87
DEPTH DRILLED (GS)	:	242.8-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	218.0-ft, Sep87; 219.4-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +2.39↔209-ft
ELEV TOP CASING	:	678.64-ft [200W-10Dec87]
ELEV GROUND SURFACE	:	676.25-ft, Brass cap [200W-10Dec87]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	209↔229-ft, 4-in #20-slot stainless steel; 231↔241-ft, 8-in telescoping, #30-slot, stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 01Dec87↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

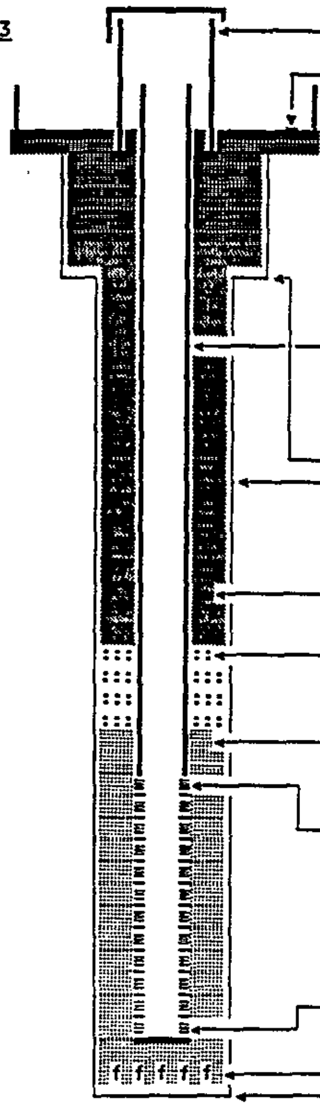
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W7-7 TEMPORARY WELL NO: None
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,509.3 E/W W 76,518.7
Driller's Name: L. Cordon	WA State Lic Nr: Not documented	State NAD83 Coordinates: N 137,636.3m 451,615 E 566,567.1m 2,218,687
Drilling Company: Basin & Range Drill	Company Location: Not documented	Start Card #: Not documented T___ R___ S___
Date Started: 23Oct89	Date Complete: 27Nov89	Elevation Ground surface (ft): 671.96 (Brass cap)

Depth to water: 211.8-ft Nov89
(Ground surface) 215.0-ft 24Mar93

GENERALIZED STRATIGRAPHY Geologist's Log
Sl=slightly

0-30: Muddy sandy GRAVEL
30-35: Gravelly sandy MUD
35-45: Gravelly muddy SAND
45-50: Muddy sandy GRAVEL
50-55: Sl gravelly sl muddy SAND
55-60: SAND
60-65: Sl gravelly SAND
65-70: Sl gravelly sl muddy SAND
70-75: Gravelly SAND
75-90: Sandy GRAVEL
90-105: Muddy sandy GRAVEL
105-110: Sl muddy gravelly SAND
110-135: Sandy GRAVEL
135-145: Muddy sandy GRAVEL
145-155: Sandy GRAVEL
155-230: Muddy sandy GRAVEL



Elevation of reference point: (top of casing) [674.94-ft]
Height of reference point above ground surface [2.98-ft]
Depth of surface seal [2-17.4-ft]
Type of surface seal: Pre-mix concrete 4x4-ft x 6-in surface pad to 2-ft 4 equidistant protective posts Cement grout-Portland Cement with gypsum, 2.0-17.4-ft
I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel
Diameter of borehole, 0-20.2-ft, 13-in nominal 20.2-227.8-ft, 9-in nominal
Type of filler, 17.4-198-ft Bentonite crumbles
Depth top of seal: [198.0-ft]
Type of seal: 3/8-in Volclay pellets
Depth top of sand pack: [202.7-ft] 20-40-mesh silica sand
Depth top of screen: [207.1-ft] 4-in, #10-slot, stainless steel with channel pack
Depth bottom of screen [227.8-ft]
Fill 229.6-230.8-ft
Depth to bottom of borehole: [230.8-ft]

Drawing By: RKL/2W07-07.ASB Date: 16Apr93

Reference: WHC-MR-0204

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-7

WELL DESIGNATION	:	299-W7-7
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,509.3 W 76,518.7 [200W-29Jan90]
LAMBERT COORDINATES	:	N 451,615 E 2,218,687 [HANCONV] N 137,636.3m E 566,567.1m [NAD83-29Jan90]
DATE DRILLED	:	Nov89
DEPTH DRILLED (GS)	:	230.8-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	211.8-ft, Nov89; 215.0-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +0.9↔207-ft; 6-in stainless steel, +2.98↔~0.5-ft
ELEV TOP CASING	:	674.94-ft [200W-29Jan90]
ELEV GROUND SURFACE	:	671.96-ft, Brass cap [200W-29Jan90]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	207.1↔227.8-ft, 4-in #10-slot stainless steel, with channel pack
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Quarterly water level measurement, 27Feb90↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

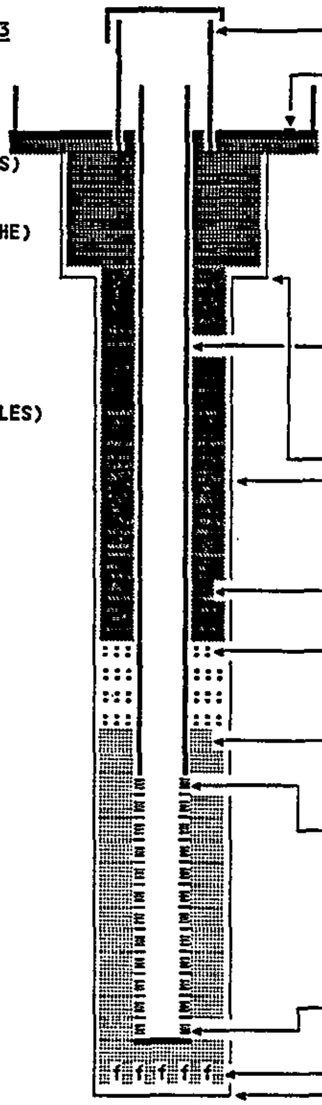
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W7-8
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	TEMPORARY WELL NO: None
Driller's Name: L. Cordon	WA State Lic Nr: Not documented	Hanford Coordinates: N/S N 46,509.8 E/W W 76,880.1
Drilling Company: Basin & Range Drill	Company Location: Not documented	State NAD83 Coordinates: N 137,637.0m 451,614 E 566,761.7m 2,218,326
Date Started: 19Oct89	Date Complete: 13Dec89	Start Card #: Not documented T___ R___ S___
		Elevation Ground surface (ft): 684.40 (Brass cap)

Depth to water: 229.2-ft Nov89
(Ground surface) 228.8-ft 24Mar93

GENERALIZED Geologist's
STRATIGRAPHY Log
Sl=slightly

0-20: Sandy GRAVEL (trace COBBLES)
20-28.5: Muddy sandy GRAVEL
28.5-35: Sandy MUD
35-39.5: Muddy SAND (trace CALICHE)
39.5-48: Sandy GRAVEL
(fines 47-48-ft)
48-51: Sl gravelly SAND
51-57: Muddy sandy GRAVEL
57-59: Gravelly SAND
59-78: SAND
78-85: Gravelly SAND
85-110: Sandy GRAVEL (trace COBBLES)
110-120: SAND
120-130: Sandy GRAVEL
130-235: Muddy sandy GRAVEL
235-240: Sl muddy gravelly SAND
240-244.5: Muddy sandy GRAVEL



Elevation of reference point: [687.35-ft]
(top of casing)
Height of reference point above [2.95-ft]
ground surface
Depth of surface seal [2-18.7-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 2-ft
4 equidistant protective posts
Cement grout-Portland Cement
with gypsum, 2.0-18.7-ft

I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel

Diameter of borehole,
0-18.7-ft, 13-in nominal
18.7-244.5-ft, 9-in nominal

Type of filler, 18.7-215-ft
8-20 mesh bentonite

Depth top of seal: [215.0-ft]
Type of seal:
1/4-in Volclay tablets

Depth top of sand pack: [217.3-ft]
20-40-mesh silica sand

Depth top of screen: [219.8-ft]
4-in, #10-slot, stainless steel
with channel pack

Depth bottom of screen [240.6-ft]

Fill 243.4-244.5-ft
Depth to bottom of borehole: [240.6-ft]

Drawing By: RKL/2W07-08.ASB Date: 16Apr93

Reference: WHC-MR-0204

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-8

WELL DESIGNATION	:	299-W7-8
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,509.8 W 76,880.1 [200W-29Jan90]
LAMBERT COORDINATES	:	N 451,614 E 2,218,326 [HANCONV] N 137,637.0m E 566,761.7m [NAD83-29Jan90]
DATE DRILLED	:	Dec89
DEPTH DRILLED (GS)	:	240.6-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	229.2-ft, Nov89; 228.8-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +ND↔207-ft; 6-in stainless steel, +2.95↔-0.5-ft
ELEV TOP CASING	:	687.35-ft, [200W-29Jan90]
ELEV GROUND SURFACE	:	684.40-ft, Brass cap [200W-29Jan90]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	219.8↔240.6-ft, 4-in #10-slot stainless steel, with channel pack
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 27Feb90↔24Mar93 Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

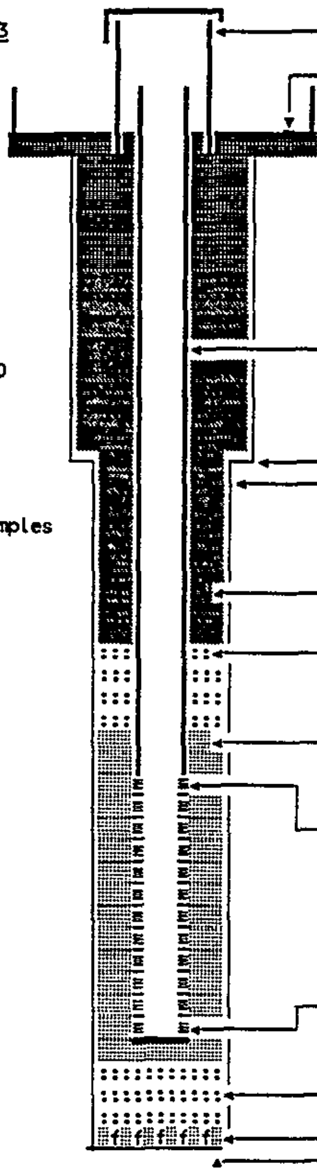
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W7-9 TEMPORARY WELL NO: W5-MW1
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,549.3 E/W W 78,888.9
Driller's Name: R. Thorsen	WA State Lic Nr: Not documented	State NAD83 Coordinates: N 137,646.59m 451,649 E 565,844.83m 2,216,317
Drilling Company: Kaiser Engineers	Company Location: Hanford	Start Card #: Not documented T___ R___ S___
Date Started: 03Oct89	Date Complete: 11Apr90	Elevation Ground surface (ft): 689.11 (Brass cap)

Depth to water: 227.0-ft Nov89
(Ground surface) 230.0-ft 24Mar93

GENERALIZED Geologist's
STRATIGRAPHY Log
Sl=slightly

0-10: Gravelly muddy SAND
10-20: Muddy sandy GRAVEL
20-25: Sandy GRAVEL
25-65: Muddy sandy GRAVEL
65-70: Sl gravelly sl muddy SAND
70-75: Muddy SAND
75-82: Muddy sandy GRAVEL
82-86: SAND
86-90: Gravelly SAND
95-104: Sl gravelly sl muddy SAND
104-138: SAND
138-144: Sl muddy SAND
144-155: Sandy GRAVEL
155-160: Gravelly SAND
160-205: Sandy GRAVEL
205-245: Muddy sandy GRAVEL
245-252.2: Not documented, no samples



Elevation of reference point: [692.09-ft]
(top of casing)
Height of reference point above ground surface [2.98-ft]

Depth of surface seal [2-19.0-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 2-ft
4 equidistant protective posts
Cement grout-Portland Cement
Type I & II, 2.5-20.2-ft

I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel

Diameter of borehole,
0-143.5-ft, 11-in nominal
143.5-252.2-ft, 9-in nominal

Type of filler, 20.2-209.8-ft
8-20 mesh bentonite crumbles

Depth top of seal: [209.8-ft]
Type of seal:
1/4-in Volclay tablets

Depth top of sand pack: [214.3-ft]
20-40-mesh silica sand

Depth top of screen: [220.3-ft]
4-in, #10-slot, stainless steel
with channel pack

Depth bottom of screen [241.1-ft]

Volclay tablets, 242.8-248.4-ft

Fill 248.4-252.2-ft

Depth to bottom of borehole: [252.2-ft]

Drawing By: RKL/2W07-09.ASB Date: 16Apr93

Reference: WHC-MR-0205

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-9

WELL DESIGNATION	:	299-W7-9
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,549.3 W 78,888.9 [200W-30Aug90]
LAMBERT COORDINATES	:	N 451,649 E 2,216,317 [HANFORD CONV]
(NAD 83)		N 137,646.59m E 565,844.83m [NAD83-30Aug90]
DATE DRILLED	:	Apr90
DEPTH DRILLED (GS)	:	252.2-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	227.0-ft, Nov89; 230.0-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +1.0↔220.3-ft; 6-in stainless steel, +2.98-↔-0.5-ft
ELEV TOP CASING	:	692.09-ft, [200W-30Aug90]
ELEV GROUND SURFACE	:	689.11-ft, Brass cap [200W-30Aug90]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	220.3↔241.1-ft, 4-in #10-slot stainless steel, with channel pack
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 19Apr90↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

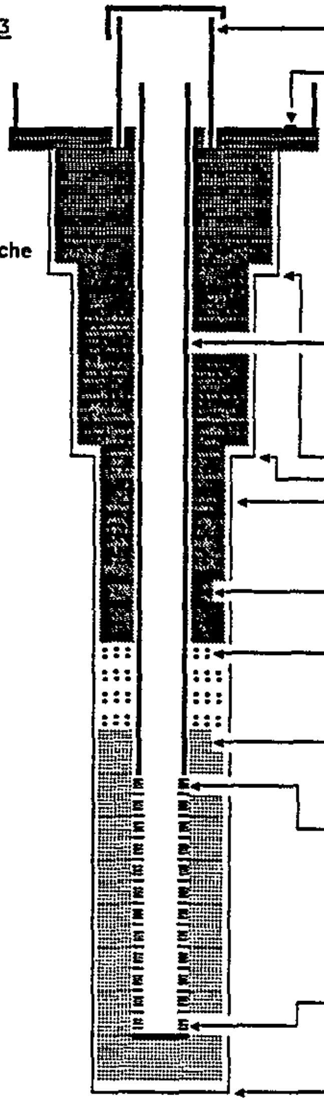
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W7-11 TEMPORARY WELL NO: MW-1
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,512 E/W W 77,769
Driller's Name: G. Thomas	WA State Lic Nr: 0867	State NAD83 Coordinates: N 137,636.0m 451,614 E 566,186.2m 2,217,437
Drilling Company: Kaiser Engineers	Company Location: Hanford	Start Card #: Not documented T___ R___ S___
Date Started: 10Apr91	Date Complete: 24May91	Elevation Ground surface (ft): 678.03 (Brass cap)

Depth to water: 215.1-ft May91
(Ground surface) 219.8-ft 24Mar93

GENERALIZED STRATIGRAPHY Geologist's Log
Sl=slightly

0–25: Sandy GRAVEL
25–30: Sl silty sandy GRAVEL
25–42: Sandy GRAVEL
42–50: SILT
50–55: Silty sandy GRAVEL w/caliche
55–60: Gravelly SAND
60–65: SAND
65–70: Gravelly silty SAND
70–75: Sl gravelly silty SAND
75–80: Silty SAND
80–85: Sl silty SAND
85–120: SAND
120–140: Sandy GRAVEL
140–155: Silty sandy GRAVEL
155–160: Sandy GRAVEL
160–165: Silty gravelly SAND
165–170: Silty sandy GRAVEL
170–175: Silty GRAVEL
175–185: Silty sandy GRAVEL
185–195: Sandy GRAVEL
195–200: Silty sandy GRAVEL
200–230: Sandy GRAVEL
230–234.5: Silty sandy GRAVEL



Elevation of reference point: (top of casing) [681.45-ft]
Height of reference point above ground surface [3.42-ft]
Depth of surface seal [1.9–20.0-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 1.9-ft
4 equidistant protective posts
Cement grout, 1.9–20.0-ft
I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel
Diameter of borehole,
0–19.8-ft, 13-in nominal
19.8–165.2-ft, 11-in nominal
165.2–234.5-ft, 9-in nominal
Type of filler, 20.0–203.9-ft
8–20 mesh bentonite crumbles
Depth top of seal: [203.9-ft]
Type of seal:
1/4–3/8-in Volclay tablets
Depth top of sand pack: [207.9-ft]
20–40-mesh silica sand
Depth top of screen: [211.5-ft]
4-in, #10-slot, stainless steel with channel pack
Depth bottom of screen [232.0-ft]
Depth to bottom of borehole: [234.5-ft]

Drawing By: RKL/2W07-11.ASB Date: 16Apr93

Reference: ____

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-11

WELL DESIGNATION	:	299-W7-11
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,512 W 77,769 [200W-28May92]
LAMBERT COORDINATES	:	N 451,614 E 2,217,437 [HANCONV] N 137,636.0m E 566,186.2m [NAD83-28May92]
DATE DRILLED	:	May91
DEPTH DRILLED (GS)	:	234.5-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	215.1-ft, May91; 219.8-ft 24Mar93
CASING DIAMETER	:	4-in stainless steel, +0.9↔211.5-ft; 6-in stainless steel, +3.42↔~0.5-ft
ELEV TOP CASING	:	681.45-ft [NGVD'29-28May92]
ELEV GROUND SURFACE	:	678.03-ft, Brass cap [NGVD'29-28May92]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	211.5↔232.0-ft, 4-in #10-slot stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 24Jan92↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar, intake @ 232.1-ft (TOC)
MAINTENANCE	:	

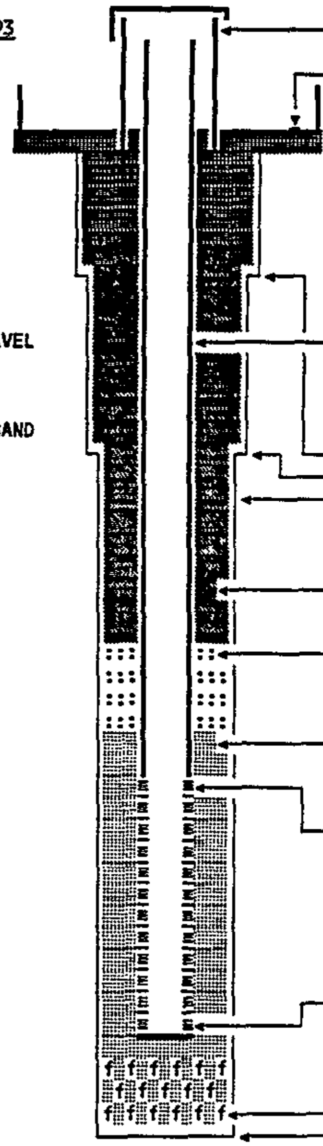
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel Hard tool	WELL NUMBER: 299-W7-12
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	TEMPORARY WELL NO:
Driller's Name: T. Gifford	WA State Lic Nr: 0867	Hanford Coordinates: N/S N 46,514 E/W W 78,246
Drilling Company: Kaiser Engineers	Company Location: Hanford	State NAD83 N 137,636.3m E 566,040.8m
Date Started: 10Apr91	Date Complete: 28May91	Coordinates: N 451,615 E 2,216,960
		Start Card #: Not documented T___ R___ S___
		Elevation Ground surface (ft): 684.64 (Brass cap)

Depth to water: 224.0-ft Jun91
(Ground surface) 226.0-ft 24Mar93

GENERALIZED Geologist's
STRATIGRAPHY Log
Sl=slightly

0-5: Sandy GRAVEL
5-10: Gravelly SAND
10-30: Silty sandy GRAVEL
30-35: Sl silty sandy GRAVEL
35-50: Silty sandy GRAVEL
50-56: Sl silty sandy GRAVEL
56-60: Silty SAND
60-63: Sandy SILT
63-65: Cemented silty, sandy GRAVEL
65-75: Silty SAND
75-80: Sl silty sandy GRAVEL
80-110: Sl gravelly silty SAND
110-115: Sl silty, sl gravelly SAND
115-120: Sl gravelly SAND
120-125: Sl silty gravelly SAND
125-135: Silty gravelly SAND
135-140: Sl silty gravelly SAND
140-160: Sl sandy silty GRAVEL
160-190: Silty GRAVEL
190-225: Sandy GRAVEL
225-230: Gravelly SAND
230-245: Sandy GRAVEL



Elevation of reference point: [687.93-ft]
(top of casing)
Height of reference point above ground surface [3.29-ft]
Depth of surface seal [1.9-22.1-ft]
Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 1.9-ft
4 equidistant protective posts
Cement grout, 1.9-22.1-ft
I.D. of riser pipe: [4-in]
Type of riser pipe:
Stainless steel
Diameter of borehole,
0-21.4-ft, 13-in nominal
21.4-164.5-ft, 11-in nominal
164.5-245.0-ft, 9-in nominal
Type of filler, 22.1-207.8-ft
8-20 mesh bentonite crumbles
Depth top of seal: [207.8-ft]
Type of seal:
1/4-3/8-in Volclay pellets
Depth top of sand pack: [214.6-ft]
10-20-mesh silica sand
Depth top of screen: [219.3-ft]
4-in, #20-slot,
T304 stainless steel
Depth bottom of screen [240.0-ft]
Fill, 240.5-245.0-ft
Depth to bottom of borehole: [245.0-ft]

Drawing By: RKL/2W07-12.ASB Date: 16Apr93

Reference:

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W7-12

WELL DESIGNATION	:	299-W7-12
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLBG
HANFORD COORDINATES	:	N 46,514 W 78,246 [200W-07Sep91]
LAMBERT COORDINATES	:	N 451,615 E 2,216,960 [HANCONV] N 137,636.3m E 566,040.8m [NAD83-07Sep91]
DATE DRILLED	:	May91
DEPTH DRILLED (GS)	:	245.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	224.0-ft, Jun91; 226.0-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +1.0↔219.3-ft; 6-in stainless steel, +3.29↔¯0.5-ft
ELEV TOP CASING	:	687.93-ft [NGVD'29-07Sep91]
ELEV GROUND SURFACE	:	684.64-ft, Brass cap [NGVD'29-07Sep91]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	219.3↔240.0-ft, 4-in #20-slot stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 24Jan92↔24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar, intake @ 236.7-ft (GS)
MAINTENANCE	:	

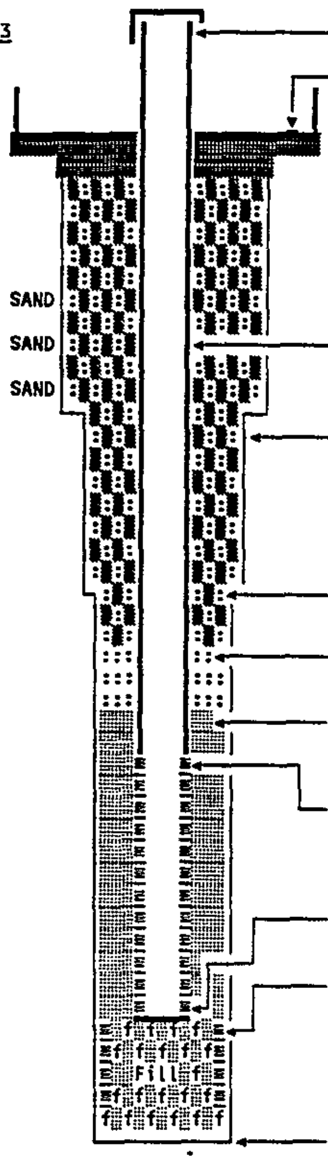
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool	WELL NUMBER: 299-W8-1 — TEMPORARY WELL NO: None
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented	Hanford Coordinates: N/S N 46,551 E/W W 79,200
Driller's Name: L. Bultena	WA State Lic Nr: Not documented	State Coordinates: N 451,650 E 2,248,987
Drilling Company: Onwego Drilling Co	Company Location: Kennewick, WA	Start Card #: Not documented T___ R___ S___
Date Started: 09Jun87	Date Complete: 23Jul87	Elevation Ground surface (ft): 699.45 (Brass cap)

Depth to water: 239.6-ft Sep88
(Ground surface) 240.4-ft 24Mar93

GENERALIZED STRATIGRAPHY — Geologist's Log

0-5: Backfill
5-65: Sandy GRAVEL
65-80: Gravelly SAND
80-90: Gravelly sandy SILT
90-95: Silty sandy GRAVEL
95-105: Sandy GRAVEL
105-110: Slightly silty gravelly SAND
110-115: Slightly gravelly SAND
115-135: Slightly gravelly silty SAND
135-145: Silty SAND
145-155: Slightly gravelly silty SAND
155-165: Silty gravelly SAND
165-180: Sandy sandy GRAVEL
180-195: Sandy GRAVEL
195-200: Silty sandy GRAVEL
200-205: Silty/clayey GRAVEL
205-210: Gravelly silty SAND
210-270.5: Silty sandy GRAVEL



Elevation of reference point: (top of casing) [701.33-ft]

Height of reference point above ground surface [1.88-ft]

Depth of surface seal [0-206-ft]

Type of surface seal: Pre-mix concrete 4x4-ft x 6-in surface pad to 3.0-ft 4 equidistant protective posts Volclay bentonite grout 3-206-ft

I.D. of riser pipe: [4-in]
Type of riser pipe: Stainless steel

Diameter of borehole,
0-62.7-ft, 13-in nominal
62.7-156.8-ft, 11-in nominal
156.8-270.5-ft, 9-in nominal

Type of filler, 3-206-ft
Volclay bentonite grout

Depth top of seal: [206.0-ft]
Type of seal: Volclay pellets

Depth top of sand pack: [210.5-ft]
20-30-mesh silica sand

Depth top of screen: [236.2-ft]
4-in, #20-slot, continous wrap 304 stainless steel

Depth bottom of screen: [256.5-ft]

Telescoping screen, 257-267.7-ft
8-in, #30-slot, continous wrap 304 stainless steel

Depth to bottom of borehole: [270.5-ft]

Drawing By: RKL/2W08-01.ASB Date: 16Apr93

Reference: ____

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W8-I

WELL DESIGNATION	:	299-W8-1
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	LLWMA-3
HANFORD COORDINATES	:	N 46,551 W 79,200 [200W-10Dec87]
LAMBERT COORDINATES	:	N 451,650 E 2,216,006 [HANCONV]
DATE DRILLED	:	Jul87
DEPTH DRILLED (GS)	:	270.5-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	239.6-ft, Sep88; 240.4-ft, 24Mar93
CASING DIAMETER	:	4-in stainless steel, +1.88-202-ft
ELEV TOP CASING	:	701.33-ft, [200W-10Dec87]
ELEV GROUND SURFACE	:	699.45-ft, Brass cap [200W-10Dec87]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	236-256-ft, 4-in #20-slot stainless steel; 257-267-ft, 8-in telescoping, #30-slot, stainless steel
COMMENTS	:	FIELD INSPECTION, OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	LLBG Monthly water level measurement, 01Dec87-24Mar93; Not on water sample schedule
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

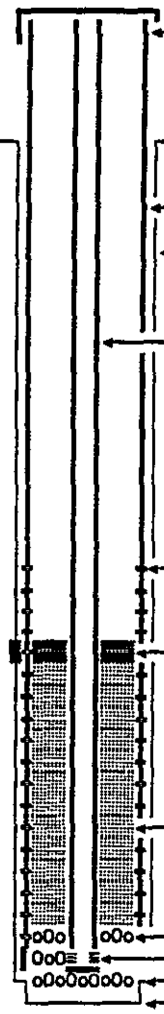
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool (nom)	WELL NUMBER: 699-51-75 A5232 TEMPORARY WELL NO:
Drilling Fluid Used: Water	Additives Used: Not documented	Hanford Coordinates: N/S N 50,667 E/W W 75,151
Driller's Name: Gentz	WA State Lic Nr: Not documented	State Coordinates: N 455,776 E 2,220,044
Drilling Company: Not documented	Company Location: Not documented	Start Card #: Not documented T 13N R 25E S 2501
Date Started: 21Aug57	Date Complete: 04Oct57	Elevation Ground surface: 639.3-ft Estimated

Depth to water: 193-ft Oct57
(Ground surface) 191.6-ft 01Jun94

GENERALIZED STRATIGRAPHY — Driller's Log

0-15: BOULDERS, GRAVEL and SAND
15-45: BOULDERS, GRAVEL
45-55: COBBLES-BOULDERS
55-65: BOULDERS-GRAVEL
65-75: COBBLES-GRAVEL-BOULDERS
75-100: COBBLES-GRAVEL
100-120: SAND, GRAVEL and COBBLES
120-130: COBBLES and GRAVEL
130-160: GRAVEL, SAND and SILT
160-170: COBBLES, GRAVEL, SAND & SILT
170-215: GRAVEL, SAND and SILT
215-225: SAND-STONE
225-230: COBBLES-GRAVEL-SAND
230-235: GRAVEL and SAND
235-240: Coarse SAND, little GRAVEL
240-255: SAND-GRAVEL
255-260: SAND, GRAVEL and COBBLES
260-270: GRAVEL and SAND
270-275: SAND little SILT
275-280: SAND-GRAVEL-SILT
280-285: SAND-GRAVEL
285-295: SAND, COBBLES, GRAVEL
295-305: Coarse GRAVEL-fine SAND
305-320: Small and coarse GRAVEL, fine SAND
320-335: Coarse GRAVEL and SAND
335-340: SAND-SILT-GRAVEL
340-345: SAND-GRAVEL
345-350: SAND-GRAVEL-COBBLES
350-360: SAND, GRAVEL, BASALT COBBLES
360-365: SAND and GRAVEL
365-370: SAND-SILT-GRAVEL
370-375: SAND, GRAVEL, BASALT
375-380: SAND, GRAVEL, BASALT and COBBLES
380-382: BASALT



Elevation of reference point: [641.51-ft]
(top of casing)
Height of reference point above ground surface [2.25-ft]
Depth of surface seal [ND]
No surface seal documented
8-in ID carbon steel casing, +2.2-376.7-ft
9-in nominal hole, 0-376.7-ft
2.0625-in tubing, +ND-370-ft
8-in casing perforations,
190-235-ft, 6 holes/ft
235-270-ft, 2 holes/ft
270-370-ft, 1 hole/ft
Cement plug, 235-345-ft
Sand fill, 245-365-ft
Gravel pack, 365-382-ft
Piezometer screen, 370-375-ft
8-in nominal hole, 376.7-382.0-ft
Borehole drilled depth: [382.0-ft]

Drawing By: RKL/6N51W75A.ASB
Date : 26Sep94
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 699-51-75

WELL DESIGNATION	:	699-51-75
RCRA FACILITY	:	Not applicable
CERCLA UNIT	:	Not applicable
HANFORD COORDINATES	:	N 50,667 W 75,151 [Hanford Wells]
LAMBERT COORDINATES	:	N 455,776 E 2,220,044 [HANCONV]
DATE DRILLED	:	Oct57
DEPTH DRILLED (GS)	:	382.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	193.0-ft, Oct57 191.6-ft, 01Jun94
CASING DIAMETER	:	8-in, carbon steel, +2.25-376.7-ft, 2.0625-in, +ND-370-ft
ELEV TOP CASING	:	641.51-ft [HANFORD WELLS]
ELEV GROUND SURFACE	:	639.3-ft, Estimated
PERFORATED INTERVAL	:	190-370-ft
SCREENED INTERVAL	:	370-375, piezometer
COMMENTS	:	FIELD INSPECTION, 31Jan90, 8-in carbon steel casing. Capped and locked No pad, posts or permanent identification. Not in radiation zone. OTHER;
AVAILABLE LOGS	:	Driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Sitewide semiannual w/l measurement, 15Oct57-01Jun94;
CURRENT USER	:	WHC ES&M w/l monitoring, PNL sitewide sampling, w/l monitoring and characterization
PUMP TYPE	:	Electric submersible
MAINTENANCE	:	Maintenance activities documented in the Hanford Wells Database System

WELL CONSTRUCTION AND COMPLETION SUMMARY

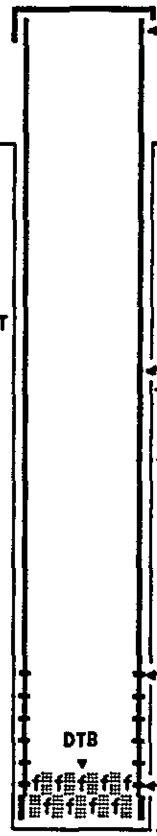
Drilling Method: Cable tool	Sample Method: Hard tool (nom)	WELL NUMBER: 699-48-71 A5214 TEMPORARY WELL NO:
Drilling Fluid Used: Water	Additives Used: Not documented	Hanford Coordinates: N/S N 47,838 E/W W 70,660
Driller's Name: Chausse- Roberts	WA State Lic Nr: Not documented	State Coordinates: N 452,958 E 2,224,542
Drilling Company: Not documented	Company Location: Not documented	Start Card #: Not documented T 13N R 25E S 31G1
Date Started: 24Aug56	Date Complete: 26Sep56	Elevation Ground surface: 686.5-ft Estimated

Depth to water: 264-ft 26Sep56
(Ground surface) 242.8-ft 02Jun94

GENERALIZED STRATIGRAPHY — Driller's Log

0-7: TOP SOIL-GRAVEL
7-27: BOULDERS-GRAVEL
27-42: SAND-SILT-some GRAVEL
42-67: SAND
67-72: SAND-GRAVEL-COBBLES
72-81: COBBLES-SAND-GRAVEL
81-90: SAND-GRAVEL-COBBLES
90-95: Cemented SAND-GRAVEL-COBBLES-SILT
95-116: SAND-SILT-GRAVEL
116-152: SAND-SILT-GRAVEL (Boulders)
152-170: SAND-GRAVEL-BOULDERS, no SILT
170-284: SAND-SILT-GRAVEL
284-295: SAND-GRAVEL
295-303: SAND-GRAVEL-SILT
303-305: SAND and SILT

REMEDIATION:
Jun73 by Page
Slotted casing,
assumed 239-251-ft [HANFORD WELLS]



Elevation of reference point: [688.15-ft]
(top of casing)
Height of reference point above ground surface [1.65-ft]

Depth of surface seal [ND]
No surface seal documented:

8-in ID carbon steel casing, +1.6-303-ft

9-in nominal hole, 0-303-ft

8-in casing perforations,:
239-251-ft, Not documented
251-302-ft, 5 holes/ft

Borehole drilled depth: [305-ft]

DTB=Depth to bottom,
283.6-ft, 12Jul93

Drawing By: RKL/6N48W72.ASB
Date : 23Sep94
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 699-48-71

WELL DESIGNATION	:	699-48-71
CERCLA UNIT	:	Not applicable
RCRA FACILITY	:	Not applicable
HANFORD COORDINATES	:	N 47,838 W 70,660 [HANFORD WELLS]
LAMBERT COORDINATES	:	N 452,958 E 2,224,542 [HANCONV]
DATE DRILLED	:	Sep56
DEPTH DRILLED (GS)	:	305-ft
MEASURED DEPTH (GS)	:	283.6-ft, 12Jul93
DEPTH TO WATER (GS)	:	264.0-ft, 26Sep56, 242.8-ft, 02Jun94
CASING DIAMETER	:	8-in, from +1.6↔303-ft
ELEV TOP CASING	:	688.15-ft [HANFORD WELLS]
ELEV GROUND SURFACE	:	686.5-ft Estimated
PERFORATED INTERVAL	:	239↔302-ft
SCREENED INTERVAL	:	Not applicable
COMMENTS	:	FIELD INSPECTION, 12Jul93, 8-in carbon steel casing. No pad, no posts. Capped and locked. No permanent identification. Not in a radiation zone. OTHER:
AVAILABLE LOGS	:	Driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Sitewide semiannual w/l measurement, 01Jun84↔02Jun94,
CURRENT USER	:	WHC ES&M w/l monitoring, PNL sitewide sampling and w/l monitoring
PUMP TYPE	:	Electric submersible
MAINTENANCE	:	Maintenance activities documented in the Hanford Wells Database System

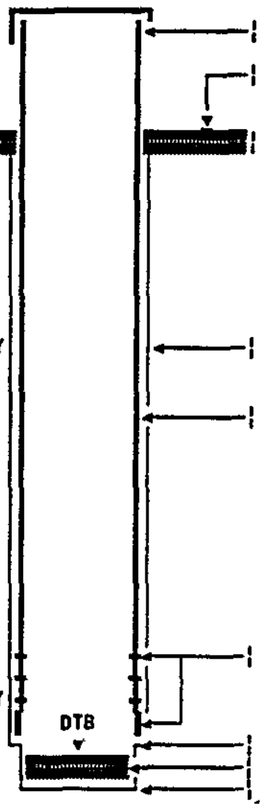
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool (nom)	WELL NUMBER: 699-49-79 A5221 TEMPORARY WELL NO:
Drilling Fluid Used: Water	Additives Used: Topsoil, clay	Hanford Coordinates: N/S N 48,600 E/W W 79,122
Driller's Name: Greenfield	WA State Lic Nr: Not documented	State Coordinates: N 453,699 E 2,216,078
Drilling Company: Not documented	Company Location: ND	Start Card #: Not documented T 13N R 25N S 36D1
Date Started: 24May48	Date Complete: 06Jul48	Elevation Ground surface: 688.1-ft Estimated

Depth to water: ~270-ft Jul48
(Ground surface) 233.8-ft 01Jun94

GENERALIZED STRATIGRAPHY — Driller's Log

0↔20: ROCKS
20↔22: Grey SAND
22↔25: Black SAND
25↔30: GRAVEL
30↔35: Black SAND
35↔40: Black and white SAND
40↔45: CLAY, SAND and GRAVEL
45↔47: Coarse B&W SAND & little GRAVEL
47↔50: Fine B&W SAND, little GRAVEL/CLAY
50↔85: SAND, CLAY & little GRAVEL
85↔95: SAND & CLAY w/very little GRAVEL
95↔117: SAND & CLAY
117↔120: SAND, CLAY & ROCKS
120↔123: SAND & GRAVEL w/little CLAY
123↔130: SAND & GRAVEL
130↔135: Grey SAND
135↔140: SAND & GRAVEL
140↔150: GRAVEL & little SAND
150↔154: SAND & GRAVEL
154↔159: SAND
159↔160: SAND, GRAVEL & ROCKS
160↔163: Fine grey SAND
163↔180: SAND & GRAVEL some ROCKS
180↔200: SAND & little GRAVEL & ROCKS
200↔210: SAND, GRAVEL, ROCKS w/some CLAY
210↔225: SAND, ROCKS & some CLAY
225↔265: SAND, CLAY & ROCKS
265↔270: SAND & silty GRAVEL
270↔277: SAND, GRAVEL & little CLAY
277↔280: SAND & GRAVEL, some ROCKS
280↔285: Silty sandy GRAVEL
285↔290: Silty SAND & GRAVEL
290 : SAND & GRAVEL



Elevation of reference point: (top of casing) [689.20-ft]
Height of reference point above ground surface [1.1-ft]
Depth of surface seal [ND]
No surface seal documented:
Has 4x4-ft concrete pad

9-in nominal hole, 0↔~265-ft

8-in ID carbon steel casing, +1.1↔~265-ft

8-in casing perforations,
225↔235-ft, 4 cuts/ft
235↔245-ft, 4 cuts/ft
245↔260-ft, 1 cut/ft
260↔265-ft, 2 cuts/ft
8-in nominal hole, ~265↔290-ft
Cement plug, ~279↔280-ft
Borehole drilled depth: [290.0-ft]

DTB=Depth to bottom,
279.4-ft, 21Feb91

REMEDIATIONS:
Aug56, Gentz,
Perforated 235↔265-ft
Aug74, M. Bultena
Perforated 225↔235-ft
Fill to 280-ft
Mar80, M. Bultena
Set cement plug @ 279-ft

Drawing By: RKL/6N49W79.ASB
Date : 23Sep94
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 699-49-79

WELL DESIGNATION	:	699-49-79
RCRA FACILITY	:	Not applicable
CERCLA UNIT	:	Not applicable
HANFORD COORDINATES	:	N 48,600 W 79,122 [HANFORD WELLS]
LAMBERT COORDINATES	:	N 453,699 E 2,216,078 [HANCONV]
DATE DRILLED	:	Jul48
DEPTH DRILLED (GS)	:	290.0-ft
MEASURED DEPTH (GS)	:	279.4-ft, 21Feb91
DEPTH TO WATER (GS)	:	~270-ft Jul48 233.8-ft, 01Jun94
CASING DIAMETER	:	8-in, carbon steel, +1.1↔~265-ft
ELEV TOP CASING	:	689.20-ft [HANFORD WELLS]
ELEV GROUND SURFACE	:	688.1-ft, Estimated
PERFORATED INTERVAL	:	225↔265-ft
SCREENED INTERVAL	:	Not applicable
COMMENTS	:	FIELD INSPECTION, 21Feb91, 8-in carbon steel casing. Capped and locked Has 4x4-ft pad, no posts, identification stamped on BM in pad. Not in radiation zone. OTHER;
AVAILABLE LOGS	:	Driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Sitewide semiannual w/l measurement, 26Nov48↔01Jun94;
CURRENT USER	:	ER characterization and WHC ES&H w/l monitoring, PNL sitewide sampling and w/l monitoring
PUMP TYPE	:	Electric submersible
MAINTENANCE	:	Maintenance activities documented in the Hanford Wells Database System

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